ZOOPLANKTON DISTRIBUTION AND ASSOCIATED BIOLOGICAL, PHYSICAL AND CHEMICAL DATA: BARKLEY SOUND, VANCOUVER ISLAND, MAY AND JUNE 1989 (MASS program)

by

J.R. Forbes, R.M. Brown, D.L. Mackas and S. Cerniuk

Institute of Ocean Sciences
Department of Fisheries and Oceans
Sidney, B.C., Canada

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ABSTRACT

Forbes, J.R., R.M. Brown, D.L. Mackas and S. Cerniuk. 1990. Zooplankton distribution and associated biological, physical and chemical data: Barkley Sound, Vancouver Island, May and June 1989 (MASS Program). Can. Data Rep. Hydrogr. Ocean Sci. 77: 109p.

Data collected during May and June 1989 in Barkley Sound, southwest Vancouver Island, as part of the Marine Survival of Salmon (MASS) program are presented. The objectives of this component of MASS were to survey the distribution, abundance and size frequency of zooplankton and investigate underlying biological and oceanographic processes controlling the zooplankton community. Maps of the surface distribution of zooplankton biomass by size category, salinity, temperature and chlorophyll fluorescence obtained by a flow-through sampling system are provided. Zooplankton identity, abundance and size distribution determined from vertical net haul samples, together with biological, physical and chemical observations from CTD casts and discrete water bottle samples are reported.

Key words: data, zooplankton, oceanographic, Barkley Sound, Vancouver Island

RESUME

Forbes, J.R., R.M. Brown, D.L. Mackas and S. Cerniuk. 1990. Zooplankton distribution and associated biological, physical and chemical data: Barkley Sound, Vancouver Island, May and June 1989 (MASS Program). Can. Data Rep. Hydrogr. Ocean Sci. 77: 109p.

Le document présente les données recueillies en mai et juin 1989 dans le détroit Barkley, au sud-ouest de l'île de Vancouver, dans le cadre du Programme de survie du saumon en mer (MASS). L'objet de cet élément du programme était de relever la répartation, l'abondance et la fréquence des tailles de zooplancton et d'étudier les processus biologiques et océanographiques qui influent sur le zooplancton. Le document renferme des cartes de répartition en surface de la biomasse de zooplancton, selon la taille, la salinité, la température et la fluorescence chlorophylienne, établies à partir d'échantillonnages par instrument d'arpentage électronique. On y indique le type de zooplancton, l'abondance et la répartition par taille, déterminées à partir d'échantillons prélevés verticalement au moyen de filets et à partir d'observations biologique, chimiques et physiques découlant de l'utilisation d'une sonde de conductivité, de température et de profondeur et à partir d'échantillonages pontuels d'eau.

Mots-clés: données, zooplancton, océanographiques, détroit Barkley, île de Vancouver

ACKNOWLEDGEMENTS

We thank Bob Taylor for piloting the **Revisor** and **Walker Rock**. He proved to be extremely helpful and flexible and his contribution was key to completing our work. Anton Phillips of the Shellfish Section, Pacific Biological Station lent the CTD to us. Brent Hargreaves and others of the Salmon Dynamics Section at PBS arranged for berths and storage of gear on the L. **Pacifica** and provided other assistance in the field. Frank Whitney of the Climate Chemistry CODE arranged access to the CHN analyzer and Autoanalyzer.

Specific analyses were performed under contract by the following individuals:

Nutrients, POC/PON	- J. Barwell-Clarke
Bacteria	- R. Blaskovitch, CBR International Corp.
Phytoplankton	- R. Waters
Zooplankton	- M. Galbraith, Sy-Tech Research Ltd.

INTRODUCTION

The Marine Survival of Salmon (MASS) program is an interdisciplinary study aimed at understanding the relationships between physical and biological oceanographic events and the dispersal and survival of salmon during their early sea life. The program was stimulated by the need to improve forecasting for Pacific salmon returns and the expanding evidence that returns of adults are strongly influenced by critical environmental factors affecting juveniles shortly after entering the sea.

A major effort within the MASS program has been directed at processes within Barkley Sound, on the west coast of Vancouver Island. The Ocean Ecology section at the Institute of Ocean Sciences (IOS) has contributed to the research in Barkley Sound by surveying the distribution, abundance and size frequency of zooplankton, and investigating underlying biological and oceanographic processes controlling the zooplankton community. This report describes the results of two surveys, which were conducted in early May and early June 1989. A second report (Forbes *et al.* 1990) provides results from a more intensive research effort during mid-May 1988, with additional zooplankton abundance data from an initial survey in late April 1987.

SAMPLING AND ANALYTICAL METHODS

1. Project design

Each of the two surveys reported here consisted of continuous underway mapping, throughout Barkley Sound, of the surface distribution of zooplankton biomass by size category, salinity, temperature and chlorophyll fluorescence. The first study (cruise OE8902) was conducted on the launch **Revisor** from 9 - 12 May 1989. Two nights of sampling were required to obtain adequate spatial coverage of the Sound, at a ship speed of 10 - 13 km/h. Navigation was by radar. The mapping was supplemented by sampling at nine stations. Here, CTD casts were performed, zooplankton were collected by vertical net hauls, and discrete water samples were collected by bottle cast, using Niskin bottles. The FRV **Walker Rock** was utilized for the second survey (cruise OE8904) from 9 - 12 June 1989. This repeated the May study, with changes to the underway transects to accommodate the navigational requirements of a different vessel, specifically greater draft and slower speed.

2. Continuous underway mapping

Continuous underway data of zooplankton by size category, salinity, temperature and chlorophyll fluorescence were collected with a flow-through electronic particle counting system (EPCS) (Mackas *et al.* 1981) coupled to temperature, conductivity and fluorescence sensors (Mackas *et al.* 1980). Water was pumped from a nominal depth of 1m, through a through-hull fitting in the engine room (OE8902) or from a hose mounted on a strut over the side (OE8904). Mapping was performed at night to permit adequate sampling of vertically migrating animals.

The zooplankton sensor counts particles with an equivalent spherical diameter of 0.3 - 3.0mm (approximately 0.08 - 8.0mm^3). Resistive particles passing through the sensor cause amplitude modulation of an A.C. excitation signal. Output pulses derived from the demodulated signal are an approximately linear function of particle volume, which allows particles to be assigned to one of ten size categories. The sensor contains four independent sensing tubes to allow for a high flow rate (approximately 25L/min). Precision of the size estimates ranges from about ±40% for the smallest detected particles to ±10% for the largest.

Periodic calibration samples for animal identity, abundance, size and size-fractionated biomass were collected by passing the outflow from the system through a tube close at one end with 0.25mm mesh netting, for 5 to 15 min. These calibration samples were either preserved with buffered formalin for identity, abundance and size analysis, or quick frozen in an alcohol bath to -40°C for size-fractionated biomass determinations. Details of sample processing are provided in section 9 below. Periodic discrete water samples were also taken from the system outflow for calibration of the temperature, conductivity and fluorescence sensors. Samples for dissolved nutrients (NO3+NO2, PO4, Si) were collected at the same time.

3. CTD and bottle casts

At each station, CTD casts were performed with an Applied Microsystems model STD12 internally recording CTD. The instrument manufacturer specifies an accuracy of ±0.01C°, with a resolution of ±0.001C° for temperature, an accuracy of ±0.05dBar for pressure, and an accuracy of ±0.01psu for salinity. Instrument malfunction precluded data recovery for a number of casts during OE8902.

Discrete water samples for salinity, chlorophyll *a*, dissolved inorganic nutrients, POC, PON, bacteria and phytoplankton analyses were collected with 5L Niskin bottles. Three depths were sampled at each station. These comprised a near-surface sample in the brackish-water layer typical of Barkley Sound, a sample from 8m, below the low-salinity water, and a deeper sample, generally from 35m.

4. Salinity

Salinity samples were collected in 250mL bottles which were rinsed three times, capped and stored for later analysis at IOS. Salinity samples were analyzed on a Guildline Autosal (Model 8400A) standardized against Standard Sea Water (Standard Sea-water Service, Institute of Oceanographic Sciences, Wormley, Godalming, England). Batch P95 8/3 1983 was used, with a stated K_{15} = 0.99997 (chlorinity = 19.373). Data are reported in practical salinity units (psu) (Lewis and Perkin 1978).

We have not determined the precision of the method ourselves. However the precision (pooled variance of replicate samples) of this method has been estimated by Macdonald *et al.* (1988) to be 0.005.

5. Chlorophyll a

Extracted chlorophyll a was determined by fluorometry (Parsons *et al.* 1984). Duplicate water samples (50mL) were filtered onto 25mm diameter Whatman GF/F glass fiber filters with a vacuum of <100mm Hg. Just before filtration was completed approximately 1mL $MgCO_3$ suspension was added to the sample and the sides of the filter funnel were rinsed with filtered seawater. The filters were then folded with the sample to the inside, placed in a paper filter cone, wrapped in aluminum foil, and frozen for later analysis at IOS. Chlorophyll was extracted in 90% aqueous acetone by grinding in a tissue grinder. The extract was clarified by filtration through a glass fiber filter and the fluorescence measured in a Turner Designs 10 fluorometer. The sample was acidified with two drops of 1.5N HCl and the fluorescence was redetermined after the reading had stabilized.

Chlorophyll a content was calculated from the equations in Parsons *et al.* (1984). The fluorometer was previously calibrated against a Perkin-Elmer Hitachi 200 spectrophotometer using crystalline chlorophyll a (Sigma Chemical Co.). Chlorophyll concentrations in the calibration samples were calculated using the equations of Jeffrey and Humphrey (1975). Based on 15 replicate samples, we have estimated the mean coefficient of variation of this method to be 4.9% (Forbes *et al.* 1988).

6. Inorganic nutrients

Samples for the analysis of dissolved nitrate+nitrite and orthophosphate were collected in 50mL glass tubes, with Teflon™ cap liners, which were rinsed three times with sample. Samples for dissolved reactive silicate were collected in 20mL polystyrene tubes, also with Teflon™ cap liners, with the same rinsing protocol. All samples were quick frozen in an alcohol bath to -40°C and stored frozen until returned to IOS. A Technicon II Auto-Analyzer was used for the analyses, with Technicon Industrial Methods No. 186-72 W and 158-71 W employed for nitrate+nitrite and reactive silicate respectively. The modification of the Technicon method by Brynjolfson (1973) was used for the analysis of orthophosphate. Sagami standards were prepared in 0, 8, 16, 24 and 32°/∞ NaCl solutions. Standards of the NaCl concentration nearest to sample salinity were used to calibrate the analyses. Where samples were obviously turbid or of low salinity, subsamples were run on the orthophosphate channel with no reagents to determine the turbidity, and sample concentrations were corrected accordingly. The recommendations of Macdonald *et al.* (1986) regarding the thawing of samples were followed.

Previous analyses of replicate samples (Denman *et al.* 1985) have shown that the expected percentage error for nitrate+nitrite is 14.3%, for orthophosphate is 9.4%, and for reactive silicate is 11.5%.

7. Particulate organic carbon and nitrogen

Water samples (1L) for particulate organic carbon (POC) and nitrogen (PON) were filtered onto precombusted (500°C, 4hr), 47mm diameter Whatman GF/F glass fiber filters. Vacuum was held at <100mm Hg during filtration and filter funnel sides were rinsed with filtered seawater just before filtration was completed. Filters were folded with the sample facing in and stored, frozen, in precombusted aluminum foil. Prior to analysis, samples were dried at 60°C for 8hr. Samples were analyzed with a Perkin-Elmer Model 240 elemental analyzer standardized with acetanilide for both carbon and nitrogen.

We have not determined the precision of the method ourselves. However, precision (pooled variance) is estimated by Macdonald *et al.* (1988) to be 1.5μg/L for POC and 0.2μg/L for PON.

8. Bacteria

For total counts of bacteria in seawater, two subsamples (20mL) from each Niskin bottle were preserved with unbuffered formaldehyde to a concentration of 2%. They were stored at 4°C in the dark prior to counting. Abundance was estimated by the method of Hobbie *et al.* (1977), with slight modification. Subsamples were stained with buffered acridine orange (0.1% in 0.02 mol tris-hydroxymethylaminomethane, pH 7.2), to a final concentration of 0.02% (Bunch 1987), and filtered onto 0.2 m pore size Nuclepore polycarbonate filters, previously dyed with Irgalin black (0.2% solution in 2.0% v/v acetic acid). Prior to filtration of the subsample, 1mL of surfactant (0.001M Triton-X) was passed through the filter to avert cell clumping due to the hydrophobic property of the Nuclepore filters. Triton-X was selected because it does not affect the background fluorescence. Enumeration was by epifluorescence microscopy, with subsample volume (typically 5mL) chosen to distribute between 20 and 100 cells per field. Ten randomly chosen fields were counted. If the ten fields contained less than 300 cells, additional randomly chosen fields were counted until this number was reached. Duplicate counts were performed on each subsample. Standard deviations of cell concentrations, as determined from the total of four counts from each Niskin bottle, are listed in the data tables.

The proportion of dividing cells was determined using the guidelines of Hagstrom *et al.* (1979). Bacteria showing a region of invagination, but no clear separation, were functionally designated as dividing cells. In general, the procedure for counting described above was used. However, if the dividing cell number was low (20 to 50 cells per ten fields), then an additional ten fields were counted.

A series of control samples was prepared by serial dilution, in filtered seawater, of a natural sample of bacteria. These were preserved with formaldehyde as above. These controls were counted several times during the counting of samples to ensure that temporal variation in the procedure was not occurring.

The mean coefficient of variation of 121 sets of counts of duplicate subsamples was 2.0% with a range from 0.6 to 6.0%.

9. Phytoplankton

Samples (250mL) were drawn from the Niskin bottles and preserved with acid Lugol's solution (Throndsen 1978). Identification and enumeration was by settling and inverted microscopy, as outlined in Sournia (1978). Specifically, each sample was shaken gently by hand for approximately 1 min. A subsample was then settled in a 10mL settling chamber, to yield between 100 and 300 cells or chains of the more abundant, medium-sized species present. Medium-sized and larger taxa were enumerated from the entire bottom at 250x magnification, unless numbers of abundant species exceeded 200. In this case, every second or every fifth transect was counted, depending on cell density. Smaller taxa occurring in large numbers were counted at 250x or 500x from two or more transects. The entire chamber was scanned for rare or exotic taxa.

10. Zooplankton

EPCS calibration samples were collected as described above. Vertical net haul samples were collected with a bongo net (397cm diam., 0.25mm mesh, black netting) from 150m, or approximately 5m above the bottom where the depth was <150m. The available winches limited the rate of retrieval to about 0.6m/s. As this precluded effective operation of a flowmeter, net collection efficiency was estimated at 85%. One subsample from each bongo haul was preserved with buffered formalin for identification and enumeration; the other was frozen in an alcohol bath to -40°C for size-fractionated biomass determination.

For identification and enumeration of zooplankton, preserved samples were initially passed through a 5mm sieve onto a 0.04mm sieve to remove the preservative and to separate the >5mm size fraction from the rest of the sample. The latter was visually examined for exotic taxa, which were removed for external verification. Generally, all individuals in this size fraction were identified to species, sex and developmental stage where possible. In the event of a very large number of individuals, this portion of the sample was subsampled to approximately 50 individuals. The remaining size fraction (0.04 to 5mm) was split to produce a subsample of no fewer than 300 individuals, which were identified and enumerated to genus, species, sex and developmental where feasible. All subsampling was performed with a Folsom splitter, which was regularly calibrated by splitting a known control sample. A complete list of taxa precedes the abundance data. In some cases taxa are staged, sexed, or both. For example, *Calanus marshallae* 1-4 refers to stages 1 to 4 and *C. marshallae* 6f to stage 6, female of this species. Size classes are used for taxa that vary in size but have either no obvious staged development (e.g. jellies) or a very complex and variable instar sequence (e.g. Euphausiids). *Oikopleura* s1, s2 and s3 is an example. S1 indicates a length of less than 5mm, s2 between 5mm and 1cm, and s3 greater than 1cm.

Size-fractionated biomass on frozen samples was determined as follows. Samples were thawed and passed through a stack of sieves with 11, 2, 0.85, 0.25 and 0.04mm mesh by gentle rinsing and backwashing in standing, filtered seawater. This was followed by a light rinse with isotonic ammonium formate (0.5N in deionized water) to remove salt. Subsamples were then filtered onto preweighed Whatman No.1 filter papers, dried for 24hr at 60°C, and the weight of the filter contents was determined. The 0.04mm sieve serves as a flag for the amount of phytoplankton contamination.

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DATA SECTION 1

CONTINUOUS UNDERWAY MAPPING TRANSECTS AND STATION LOCATIONS

Fig. 1 OE8902 EPCS Line Track 9 - 10 May 1989

Fig. 2 OE8902 EPCS Line Track 10 - 11 May 1989

Fig. 3 OE8904 EPCS Line Track 9 - 10 June 1989

Fig. 4 OE8904 EPCS Line Track 10 - 11 June 1989

Fig. 5 OE8902 Station locations (CTD + bottle casts)

Fig. 6 OE8902 Station locations (underway calibration samples)

Fig. 7 OE8904 Station locations (CTD + bottle casts)

Fig. 8 OE8904 Station locations (underway calibration samples)

Fig. 1 OE8902 EPCS Line Track 9 - 10 May 1989

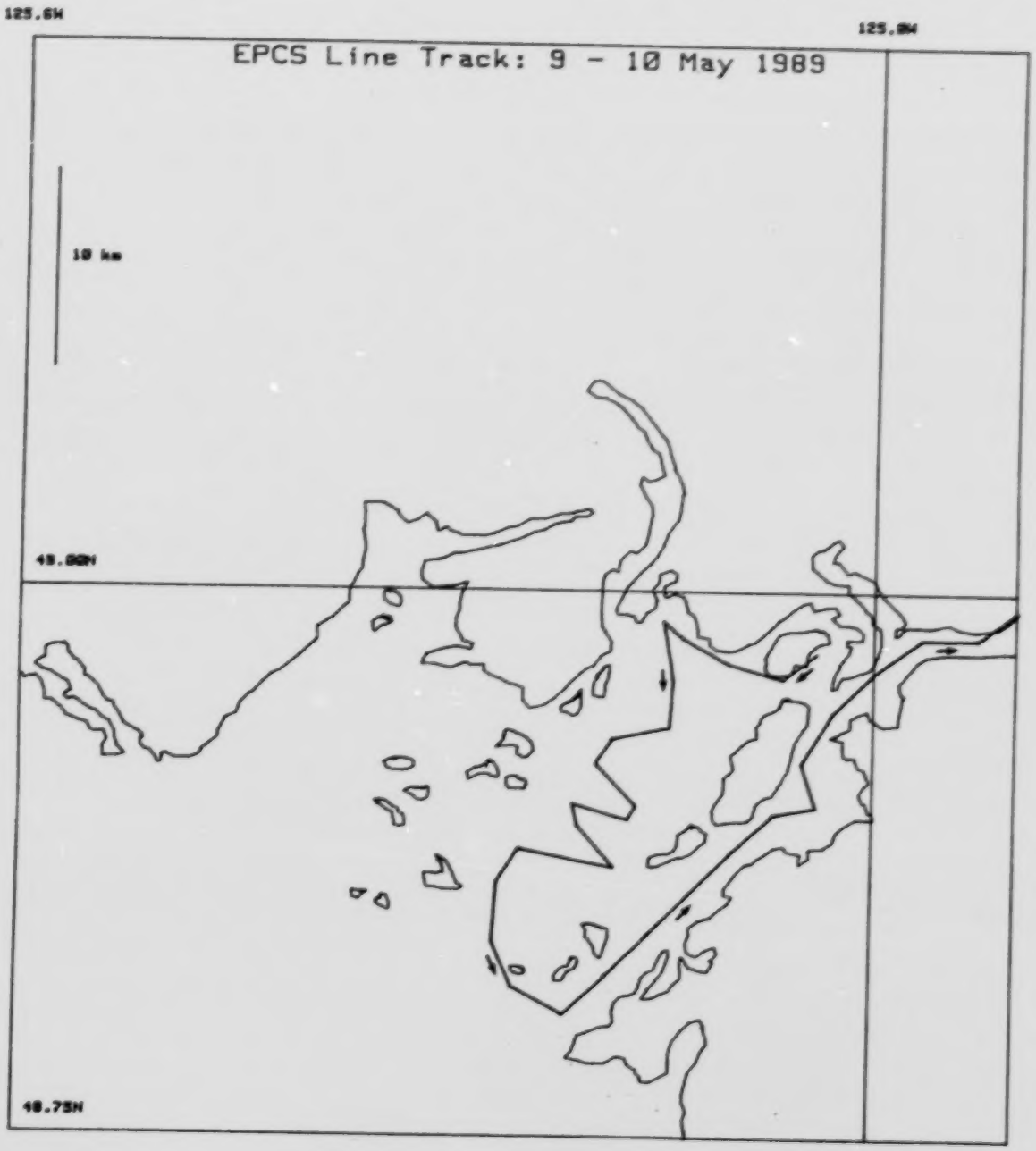


Fig. 2 OE8902 EPCS Line Track 10 - 11 May 1989

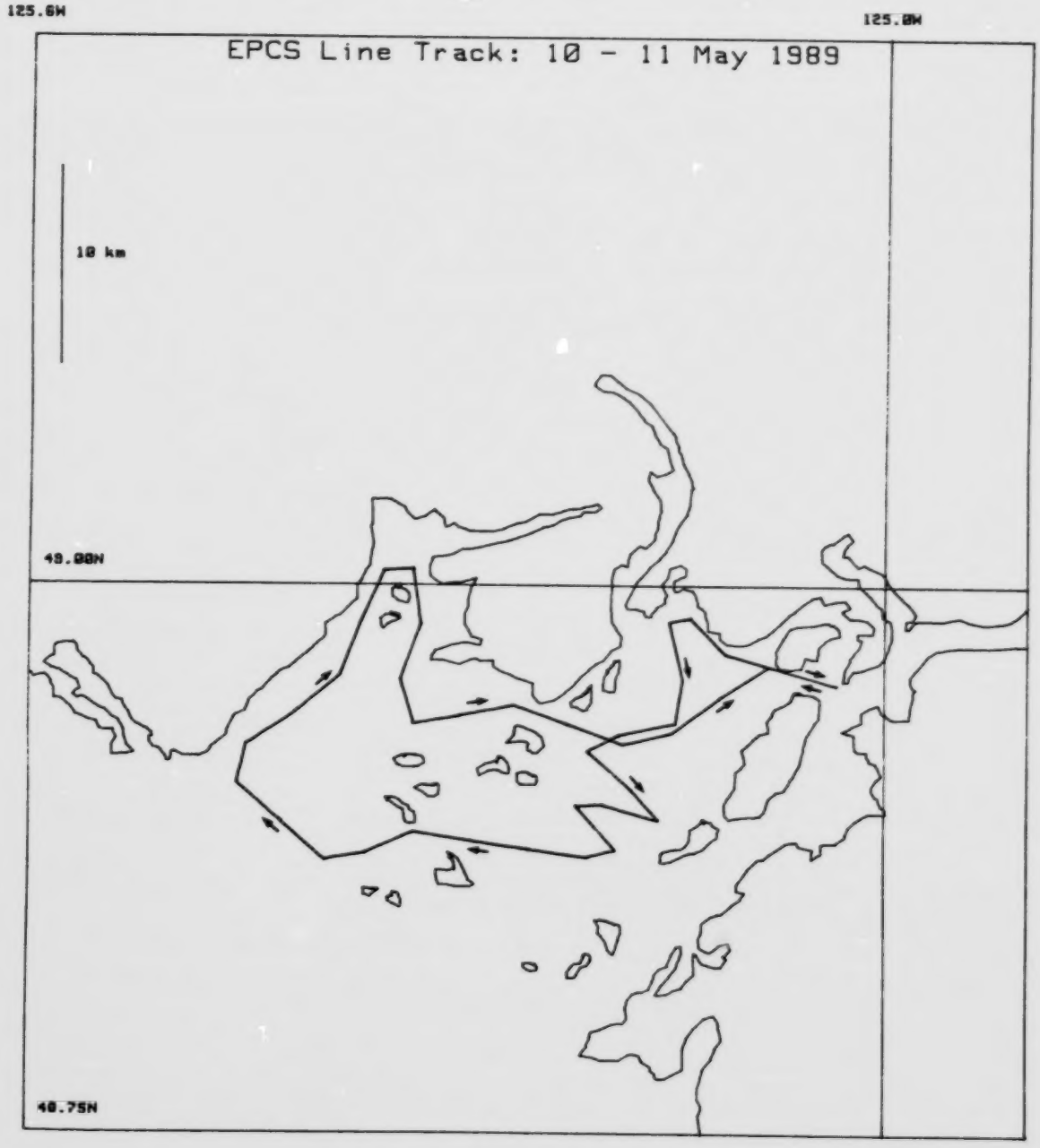


Fig. 3 OE8904 EPCS Line Track 9 - 10 June 1989

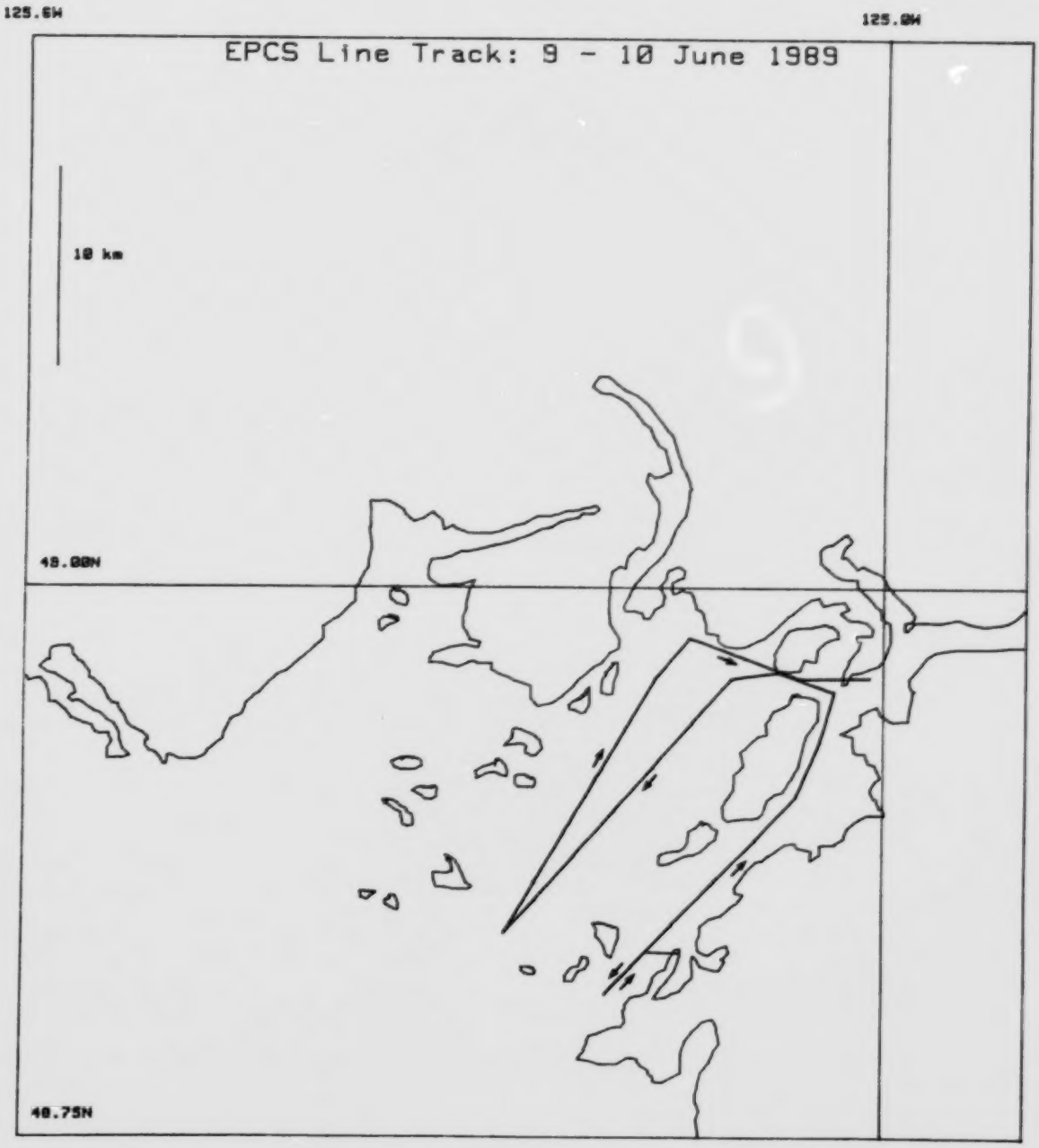


Fig. 4 OE8904 EPCS Line Track 10 - 11 June 1989

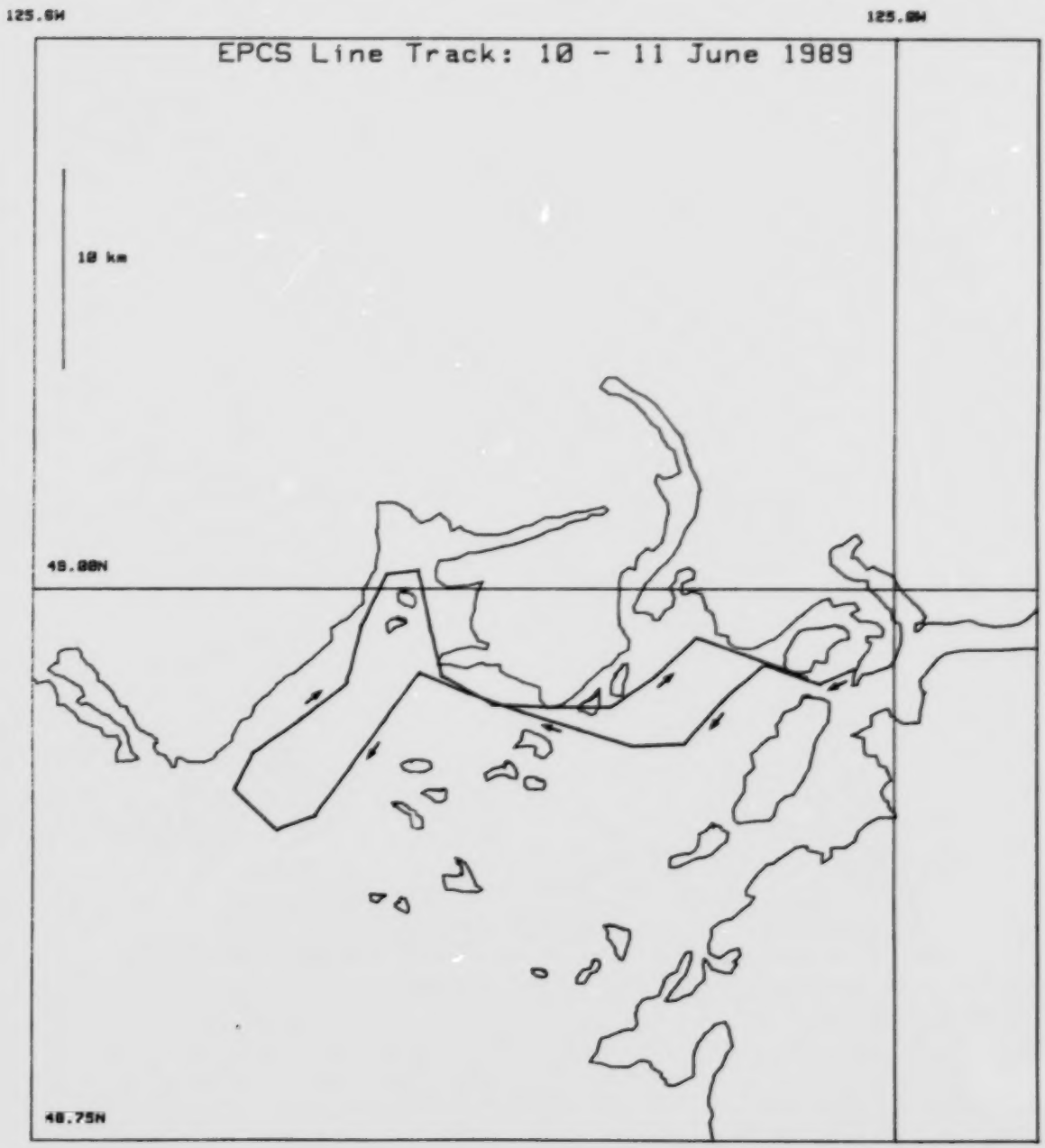


Fig. 5 OE8902 Station locations (CTD + bottle casts)

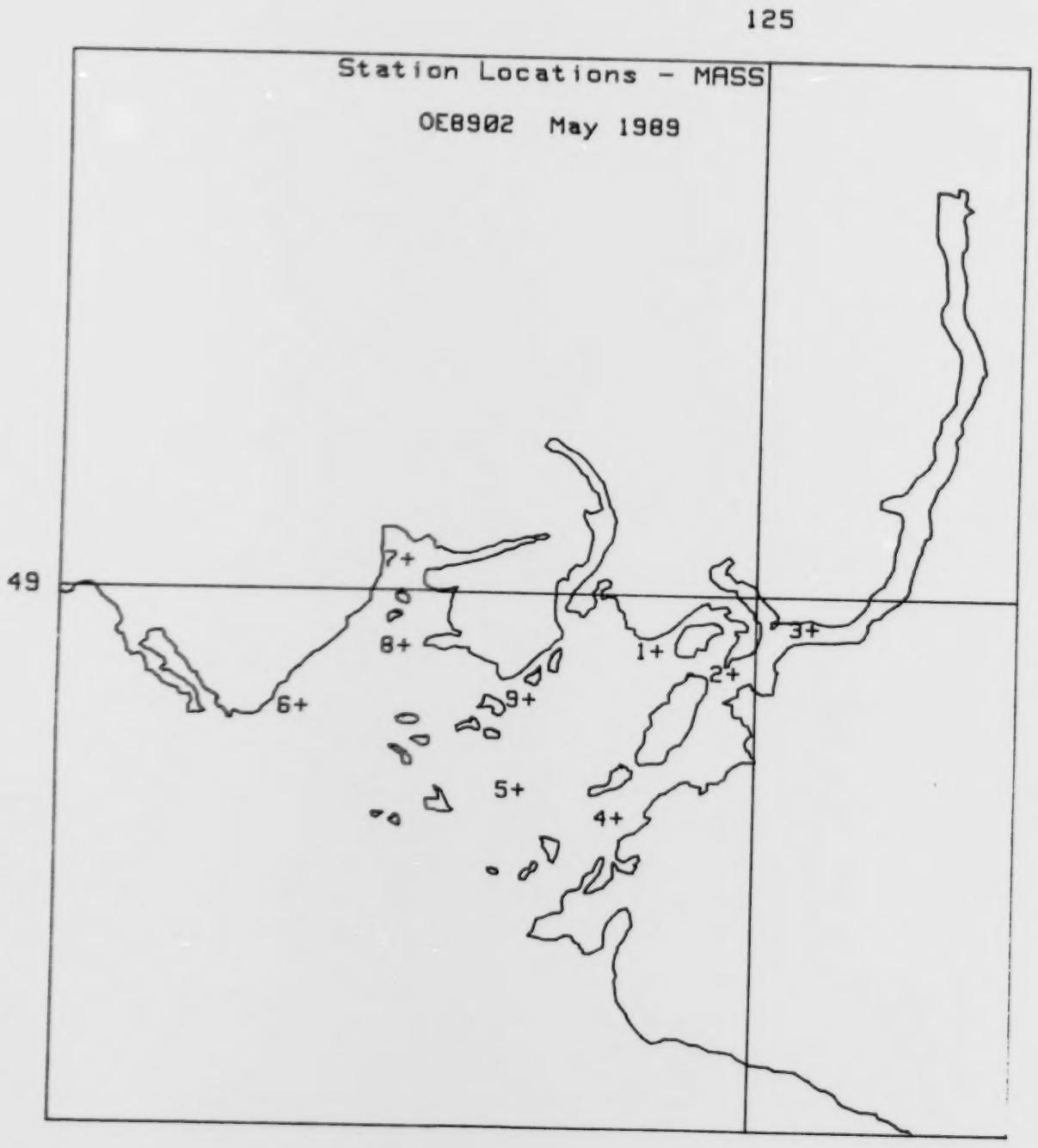


Fig. 6 OE8902 Station locations (underway calibration samples)

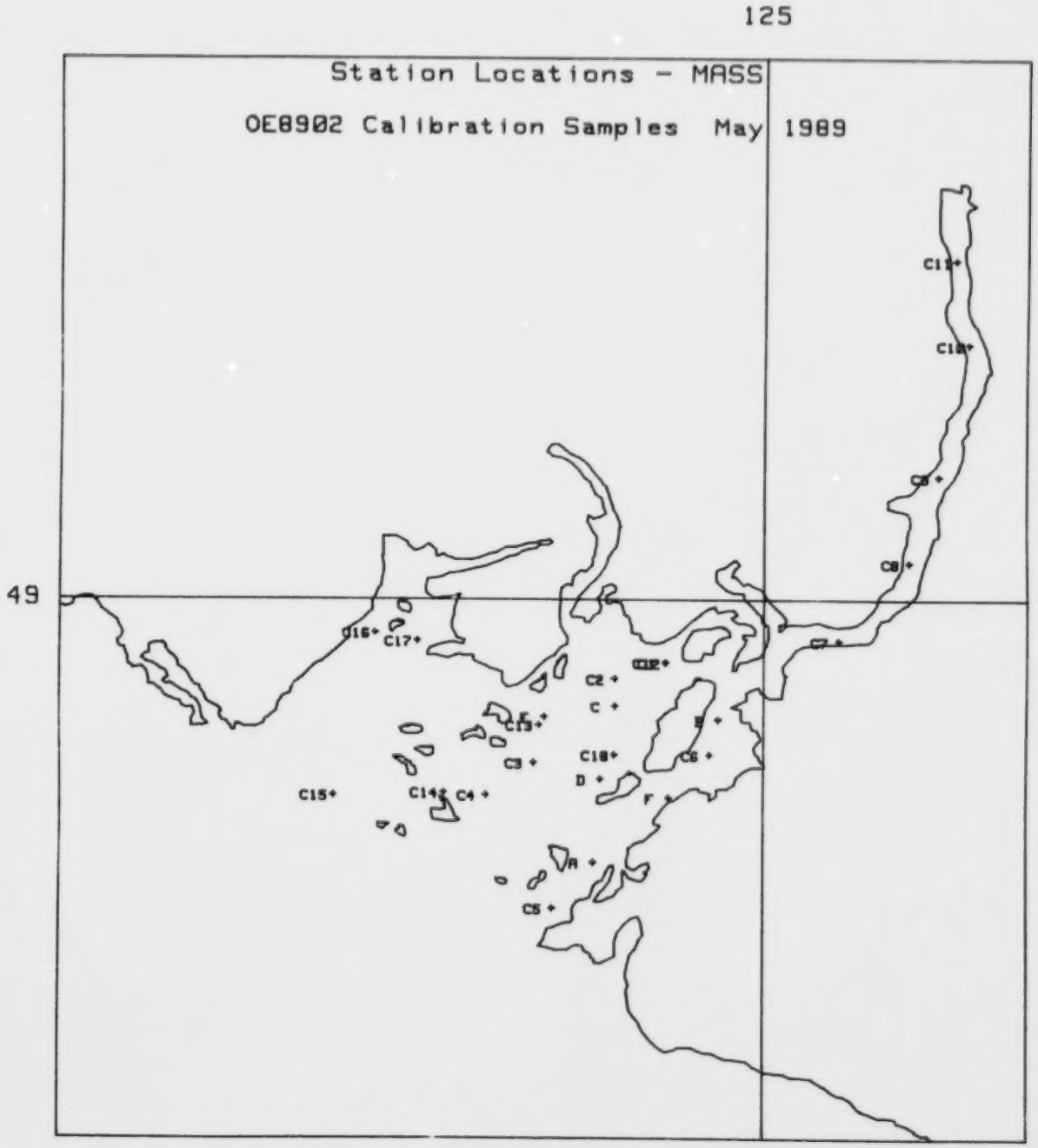


Fig. 7 OE8904 Station locations (CTD + bottle casts)

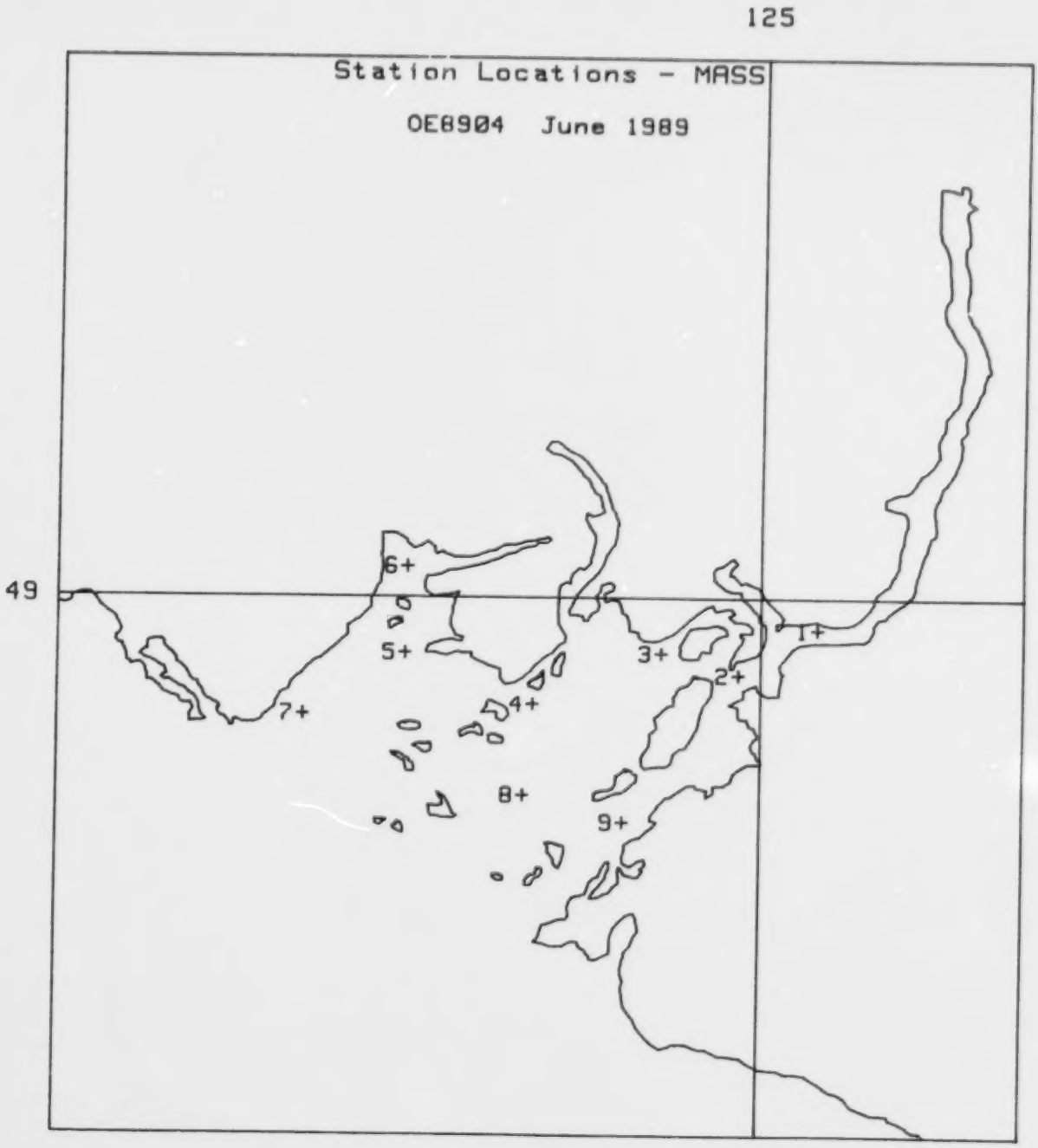
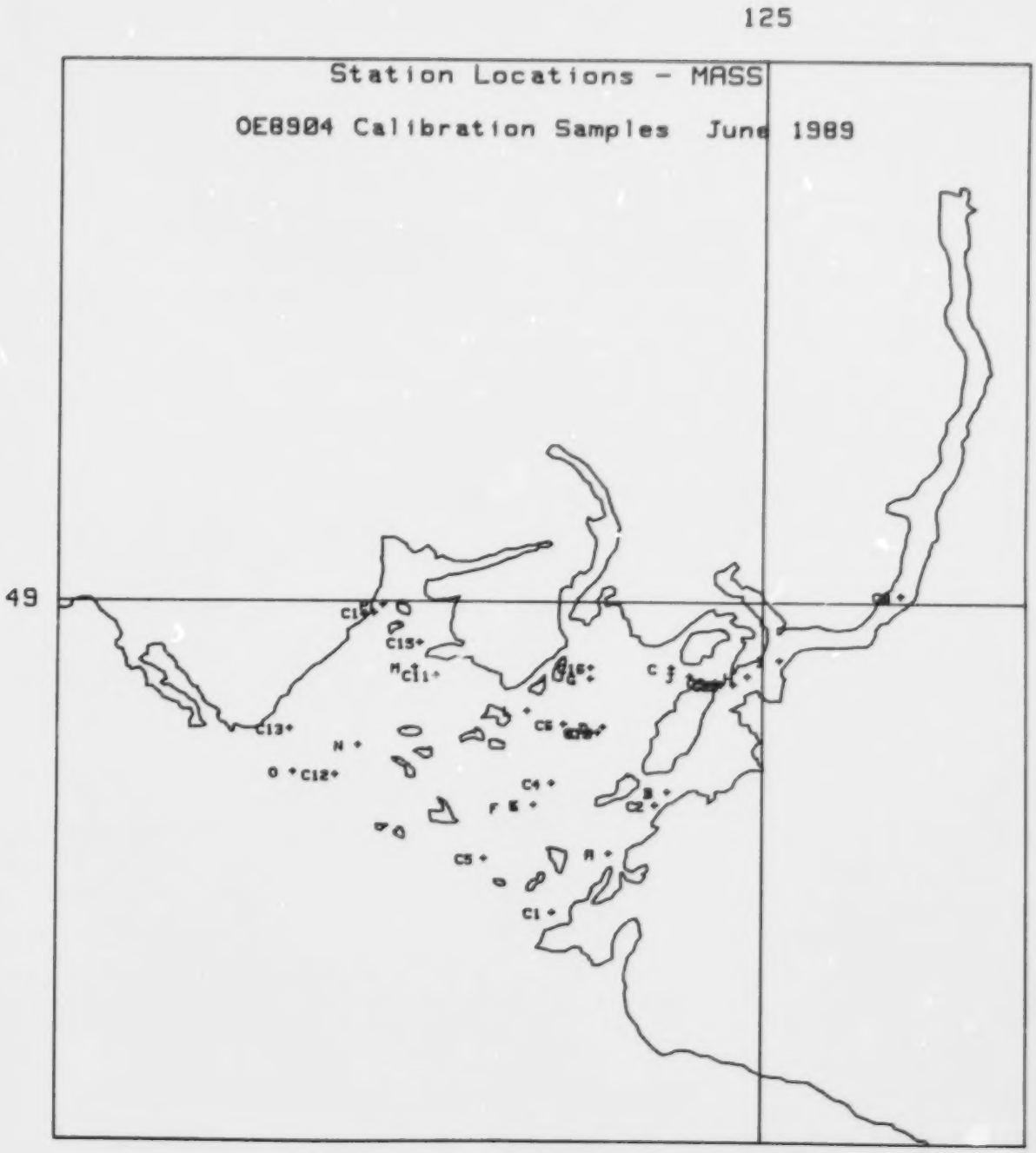


Fig. 8 OE8904 Station locations (underway calibration samples)



DATA SECTION 2

DATA INVENTORY

Table 1 OE8902 data collected

Table 2 OE8904 data collected

Table 3 OE8902 and OE8904 zooplankton sample inventory

[Data invent. tables: + data collected
- data not collected]

TABLE 1 OE8902 DATA COLLECTED

Station	Date	Time (PDT)	Latitude	Longitude	CTD	Sal.	Temp.	Chl a	Nutr.	POC/PON	Bact.	Phyto.	Zoopl.
1	11 May	2000	48 57.9	125 05.6	+	+	+	+	+	+	+	+	+
2	11 May	2145	48 57.1	125 01.2	+	+	+	+	+	+	+	+	+
3	12 May	0605	48 58.8	124 57.8	-	+	-	+	+	+	+	+	+
4	12 May	0815	48 51.7	125 07.7	+	+	+	+	+	+	+	+	+
5	12 May	1010	48 52.7	125 13.9	-	+	-	+	+	+	+	+	+
6	12 May	1235	48 55.6	125 26.0	-	+	-	+	+	+	+	+	+
7	12 May	1400	49 01.1	125 20.1	-	+	-	+	+	+	+	+	+
8	12 May	1530	48 58.0	125 20.3	-	+	-	+	+	+	+	+	+
9	12 May	1645	48 56.0	125 13.0	-	+	-	+	+	+	+	+	+
C 1	9 May	1918	48 57.9	125 05.5	-	+	+	+	+	-	-	-	-
C 2	9 May	1958	48 57.3	125 08.4	-	+	+	+	+	-	-	-	-
C 3	9 May	2106	48 54.2	125 13.0	-	+	+	+	+	-	-	-	-
C 4	9 May	2153	48 53.0	125 15.7	-	+	+	+	+	-	-	-	-
C 5	9 May	2243	48 48.8	125 11.9	-	+	+	+	+	-	-	-	-
C 6	10 May	0016	48 54.5	125 03.0	-	+	+	+	+	-	-	-	-
C 7	10 May	0109	48 58.7	124 55.7	-	+	+	+	+	-	-	-	-
C 8	10 May	0144	49 01.6	124 51.7	-	+	-	+	+	-	-	-	-
C 9	10 May	0214	49 04.8	124 50.0	-	+	+	+	+	-	-	-	-
C 10	10 May	0258	49 09.7	124 48.3	-	+	+	+	+	-	-	-	-
C 11	10 May	0324	49 12.8	124 49.1	-	+	+	+	+	-	-	-	-
C 12	10 May	2014	48 57.9	125 05.5	-	+	+	+	+	-	-	-	-
C 13	10 May	2146	48 55.6	125 12.7	-	+	+	+	+	-	-	-	-
C 14	10 May	2325	48 53.1	125 18.1	-	+	+	+	+	-	-	-	-
C 15	11 May	0024	48 53.0	125 24.4	-	+	+	-	+	-	-	-	-
C 16	11 May	0144	48 59.0	125 22.0	-	+	+	+	+	-	-	-	-
C 17	11 May	0228	48 58.7	125 19.6	-	+	+	+	+	-	-	-	-
C 18	11 May	0416	48 54.5	125 08.4	-	+	+	+	+	-	-	-	-

TABLE 2 OE8904 DATA COLLECTED

Station	Date	Time (PDT)	Latitude	Longitude	CTD	Sal.	Temp.	Chl a	Nutr.	POC/PON	Bact.	Phyto.	Zoopl.
1	11 June	1600	48 58.8	124 57.6	-	+	-	+	+	+	+	+	+
2	11 June	1840	48 57.1	125 01.2	+	+	+	+	+	+	+	+	+
3	11 June	2044	48 57.9	125 05.1	+	+	+	+	+	+	+	+	+
4	11 June	2200	48 56.0	125 13.0	+	+	+	+	+	+	+	+	+
5	12 June	0555	48 58.0	125 20.3	+	+	+	+	+	+	+	+	+
6	12 June	0710	49 01.1	125 20.1	+	+	+	+	+	+	+	+	+
7	12 June	0840	48 55.6	125 26.0	+	+	+	+	+	+	+	+	+
8	12 June	1025	48 52.7	125 13.4	+	+	+	+	+	+	+	+	+
9	12 June	1115	48 51.6	125 07.7	+	+	+	+	+	+	+	+	+
C 1	9 June	2104	48 48.7	125 11.8	-	+	-	+	+	-	-	-	-
C 2	9 June	2201	48 52.7	125 08.0	-	+	+	+	+	-	-	-	-
C 3	9 June	2258	48 57.3	125 02.6	-	+	+	+	+	-	-	-	-
C 4	10 June	0018	48 53.5	125 11.9	-	+	+	+	+	-	-	-	-
C 5	10 June	0102	48 50.7	125 15.7	-	+	+	+	+	-	-	-	-
C 6	10 June	0157	48 55.7	125 11.2	-	+	+	+	+	-	-	-	-
C 7	10 June	0321	48 57.2	125 01.6	-	+	+	+	+	-	-	-	-
C 8	10 June	0435	49 00.5	124 52.1	-	+	+	+	+	-	-	-	-
C 9	10 June	2116	48 57.2	125 02.3	-	+	+	+	+	-	-	-	-
C 10	10 June	2209	48 55.4	125 09.3	-	+	+	+	+	-	-	-	-
C 11	10 June	2315	48 57.5	125 18.5	-	+	+	+	+	-	-	-	-
C 12	11 June	0014	48 53.8	125 24.2	-	+	+	+	+	-	-	-	-
C 13	11 June	0104	48 55.5	125 26.8	-	+	+	+	+	-	-	-	-
C 14	11 June	0200	48 59.8	125 22.0	-	+	+	+	+	-	-	-	-
C 15	11 June	0246	48 58.7	125 19.4	-	+	+	+	+	-	-	-	-
C 16	11 June	0415	48 57.8	125 09.7	-	+	+	+	+	-	-	-	-

TABLE 3 OE8902 AND OE89043 ZOOPLANKTON SAMPLE INVENTORY

Bongo Net Samples

Station	Date	Time	Latitude	Longitude	Chart z	Net haul z
OE8902						
1	11 May	2015	48 57.9	125 05.6	110	100
2	11 May	2105	48 57.1	125 01.2	250	150
3	12 May	0650	48 58.8	124 57.8	190	150
4	12 May	0820	48 51.7	125 07.7	132	120
5	12 May	1030	48 52.7	125 13.9	92	85
6	12 May	1240	48 55.6	125 26.0	33	27
7	12 May	1310	49 01.1	125 20.1	27	24
8	12 May	1515	48 56.0	125 20.3	36	32
9	12 May	1630	48 56.0	125 13.0	81	80
OE8904						
1	11 June	1600	48 58.8	124 57.8	190	150
2	11 June	1925	48 57.1	125 01.2	250	150
3	11 June	2110	48 57.9	125 05.1	110	100
4	11 June	2210	48 56.0	125 13.0	81	73
5	12 June	0555	48 58.0	125 20.3	36	35
6	12 June	0710	49 01.1	125 20.1	27	24
7	12 June	0840	48 55.6	125 26.0	33	25
8	12 June	1025	48 52.7	125 13.4	92	85
9	12 June	1115	48 51.6	125 07.7	132	130

EPCS Samples

OE8902	Date	Start Lat.	Start Long.	Start (PDT)	End (PDT)	Time (min)	Size-fractioned (SF) or Enumerated (E)
A	9 May	48 50.5	125 09.6	2301	2306	5.0	SF
B	10 May	48 55.8	125 02.5	0028	0043	15.0	SF
C	10 May	48 56.3	125 08.4	2058	2108	10.0	SF
D	10 May	48 53.6	125 09.2	2209	2219	10.0	E
E	11 May	48 55.9	125 12.4	0348	0358	10.0	E
F	11 May	48 52.9	125 05.3	0439	0447	10.0	E
OE8904							
A	9 June	48 50.9	125 08.6	2137	2147	10.0	E
B	9 June	48 53.2	125 05.3	2207	2217	10.0	SF
C	9 June	48 57.8	125 05.1	2314	2319	5.0	SF
D	9 June	48 55.6	125 09.0	2355	0005	10.0	SF
E	10 June	48 52.7	125 12.9	0028	0038	10.0	E
F	10 June	48 52.6	125 14.0	0123	0133	10.0	SF
G	10 June	48 57.4	125 09.7	0216	0221	5.0	E
H	10 June	48 57.5	125 00.8	0326	0331	5.0	SF
I	10 June	48 58.1	124 59.0	0338	0343	5.0	E
J	10 June	48 57.7	125 04.1	2127	2137	10.0	E
K	10 June	48 55.4	125 09.7	2210	2220	10.0	SF
L	10 June	48 56.2	125 13.3	2236	2241	5.0	SF
M	10 June	48 57.8	125 19.7	2325	2335	10.0	E
N	11 June	48 54.9	125 22.9	0001	0111	10.0	E
O	11 June	48 53.9	125 26.6	0038	0048	10.0	SF
P	11 June	49 00.1	125 21.5	0205	0215	10.0	E

DATA SECTION 3

ZOOPLANKTON SIZE DISTRIBUTION; SURFACE ZOOPLANKTON BIOMASS, SALINITY, TEMPERATURE AND FLUORESCENCE

Fig. 9 OE8902 Zooplankton biomass (size-fractioned) (Vertical net haul data)

Fig. 10 OE8904 Zooplankton biomass (size-fractioned) (Vertical net haul data)

Fig. 11 OE8902 EPCS Zooplankton biomass 9 - 10 May 1989

Fig. 12 OE8902 EPCS Zooplankton biomass 10 - 11 May 1989

Fig. 13 OE8902 EPCS Surface salinity 9 - 10 May 1989

Fig. 14 OE8902 EPCS Surface salinity 10 - 11 May 1989

Fig. 15 OE8902 EPCS Surface temperature 9 - 10 May 1989

Fig. 16 OE8902 EPCS Surface temperature 10 - 11 May 1989

Fig. 17 OE8902 EPCS Surface fluorescence 9 - 10 May 1989

Fig. 18 OE8902 EPCS Surface fluorescence 10 - 11 May 1989

Fig. 19 OE8904 Surface zooplankton biomass 9 - 10 June 1989

Fig. 20 OE8904 Surface zooplankton biomass 10 - 11 June 1989

Fig. 21 OE8904 Surface salinity 9 - 10 June 1989

Fig. 22 OE8904 Surface salinity 10 - 11 June 1989

Fig. 23 OE8904 Surface temperature 9 - 10 June 1989

Fig. 24 OE8904 Surface temperature 10 - 11 June 1989

Fig. 25 OE8904 Surface fluorescence 9 - 10 June 1989

Fig. 26 OE8904 Surface fluorescence 10 - 11 June 1989

Fig. 9 OE8902 Zooplankton biomass (size-fractioned)
(Vertical net haul data)

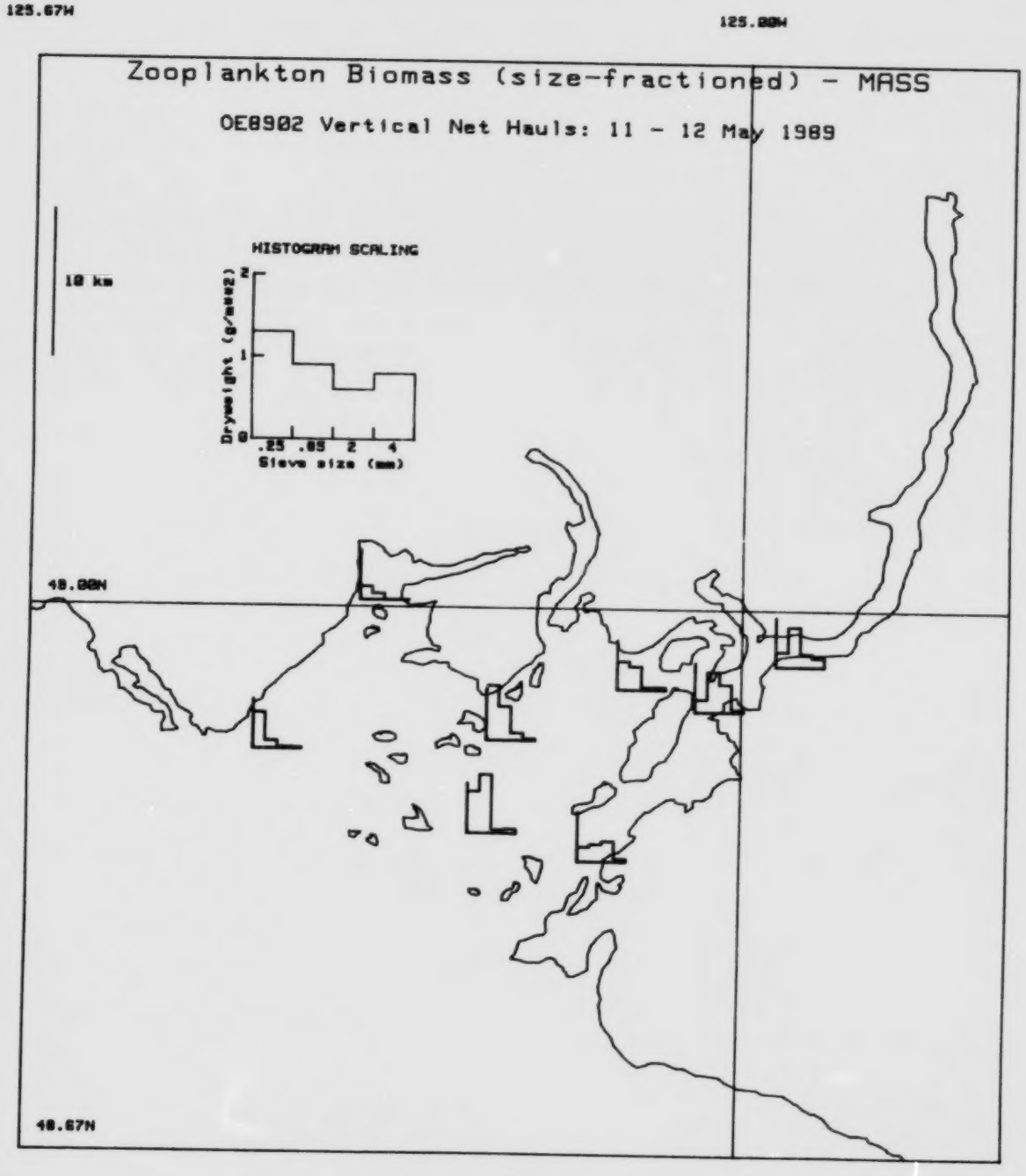


Fig. 10 OE8904 Zooplankton biomass (size-fractioned)
(Vertical net haul data)

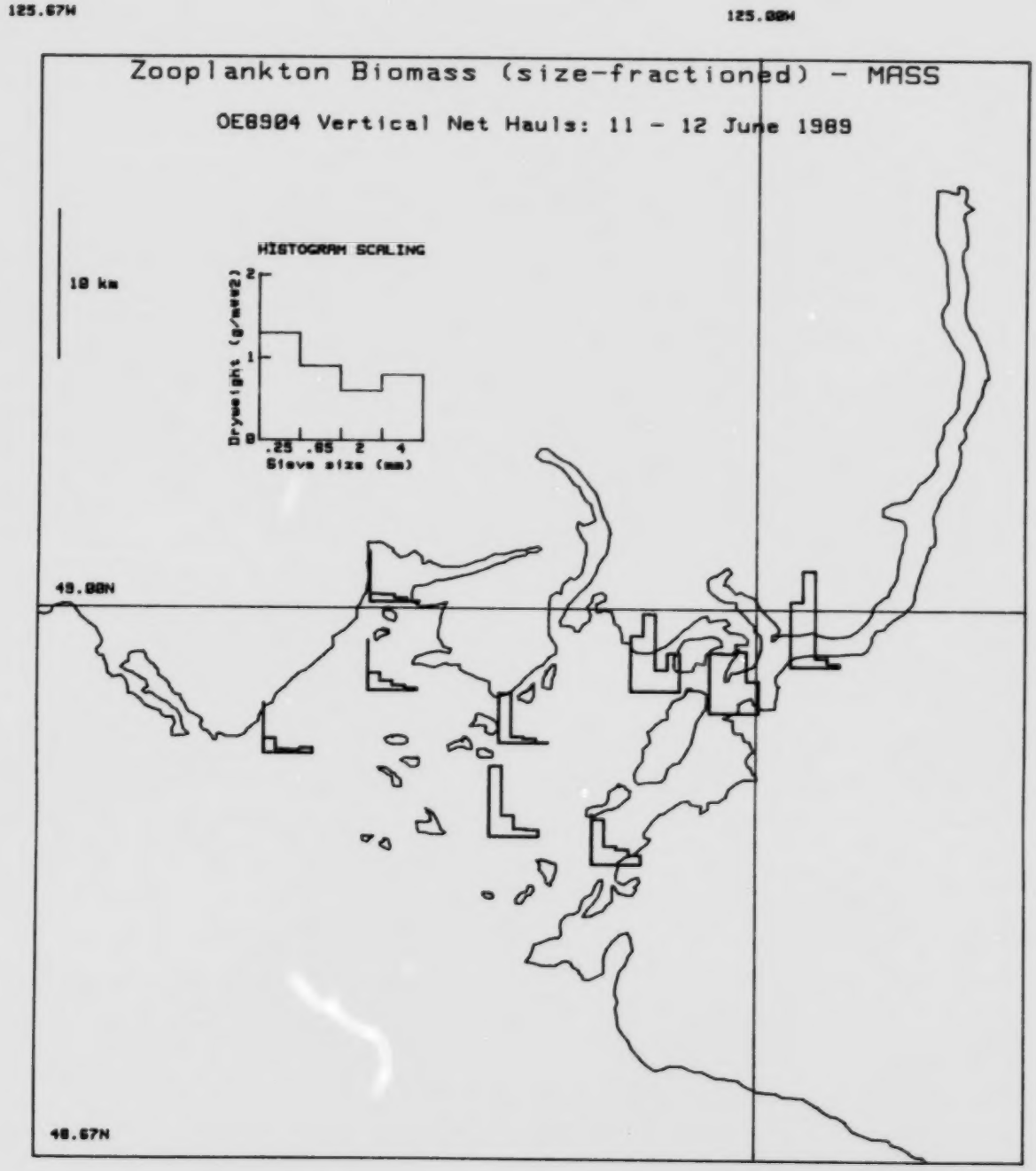


Fig. 11 OE8902 EPCS zooplankton biomass 9 - 10 May 1989

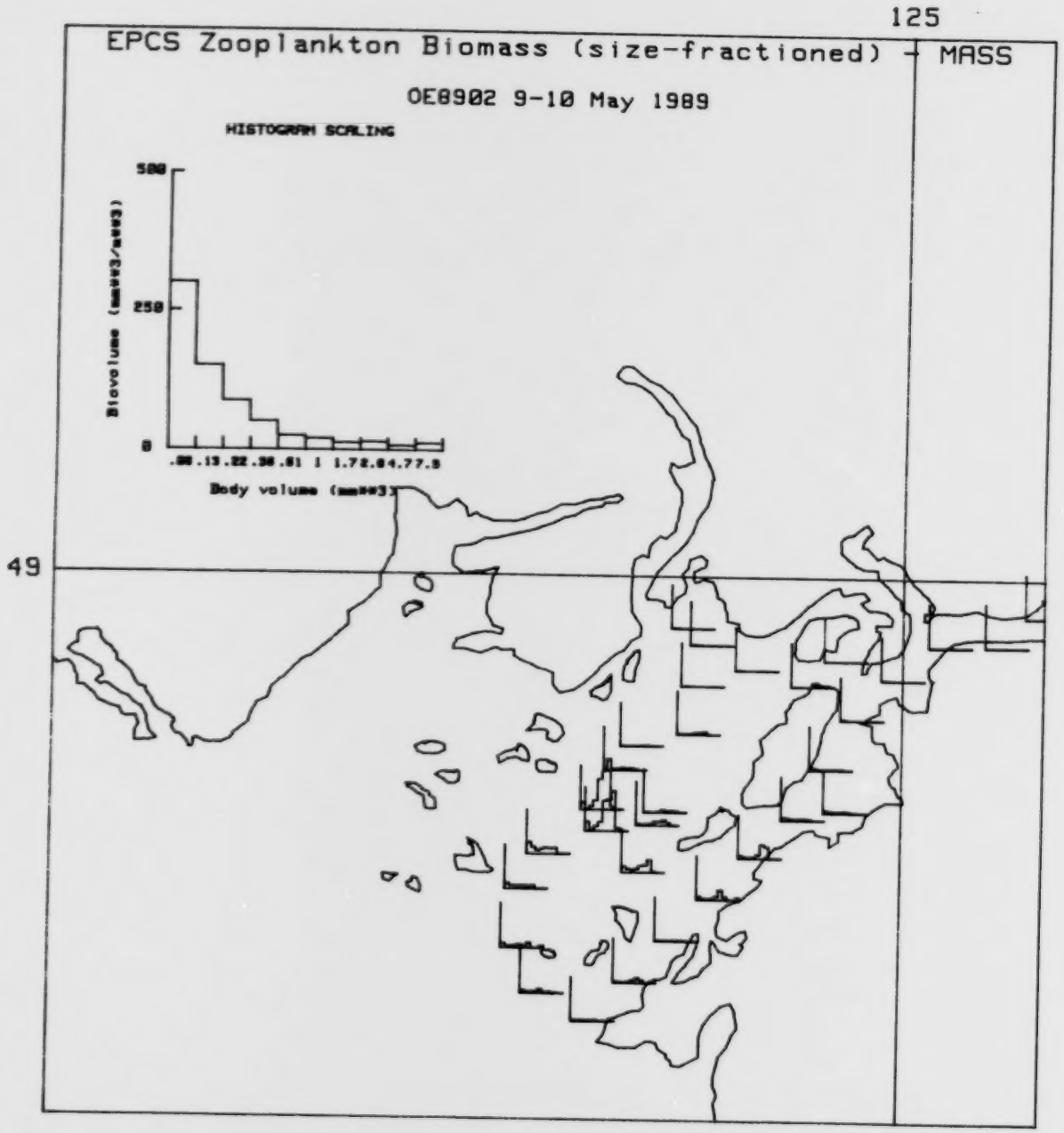


Fig. 12 OE8902 EPCS zooplankton biomass 10 - 11 May 1989

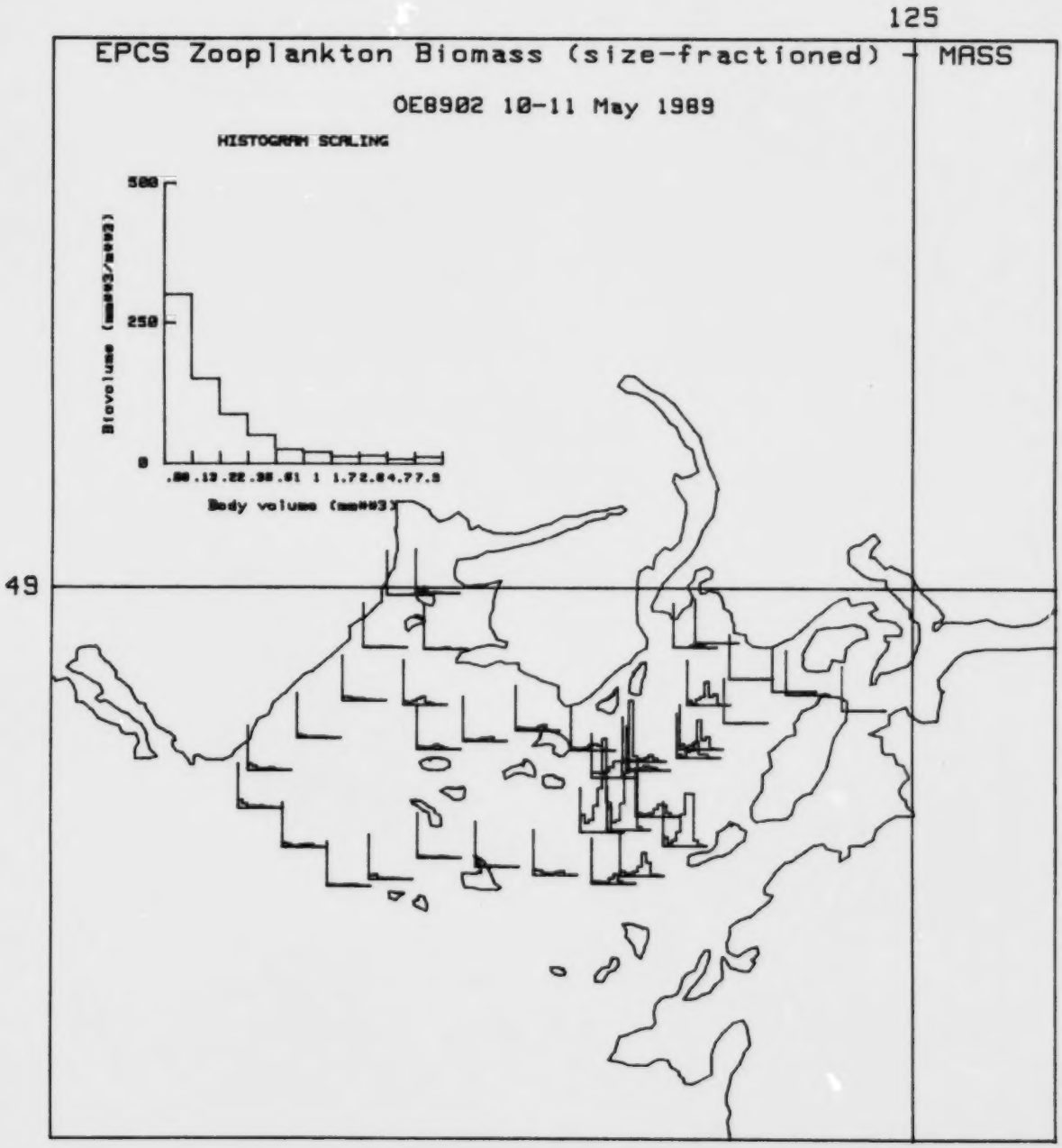


Fig. 13 OE8902 EPCS surface salinity 9 - 10 May 1989

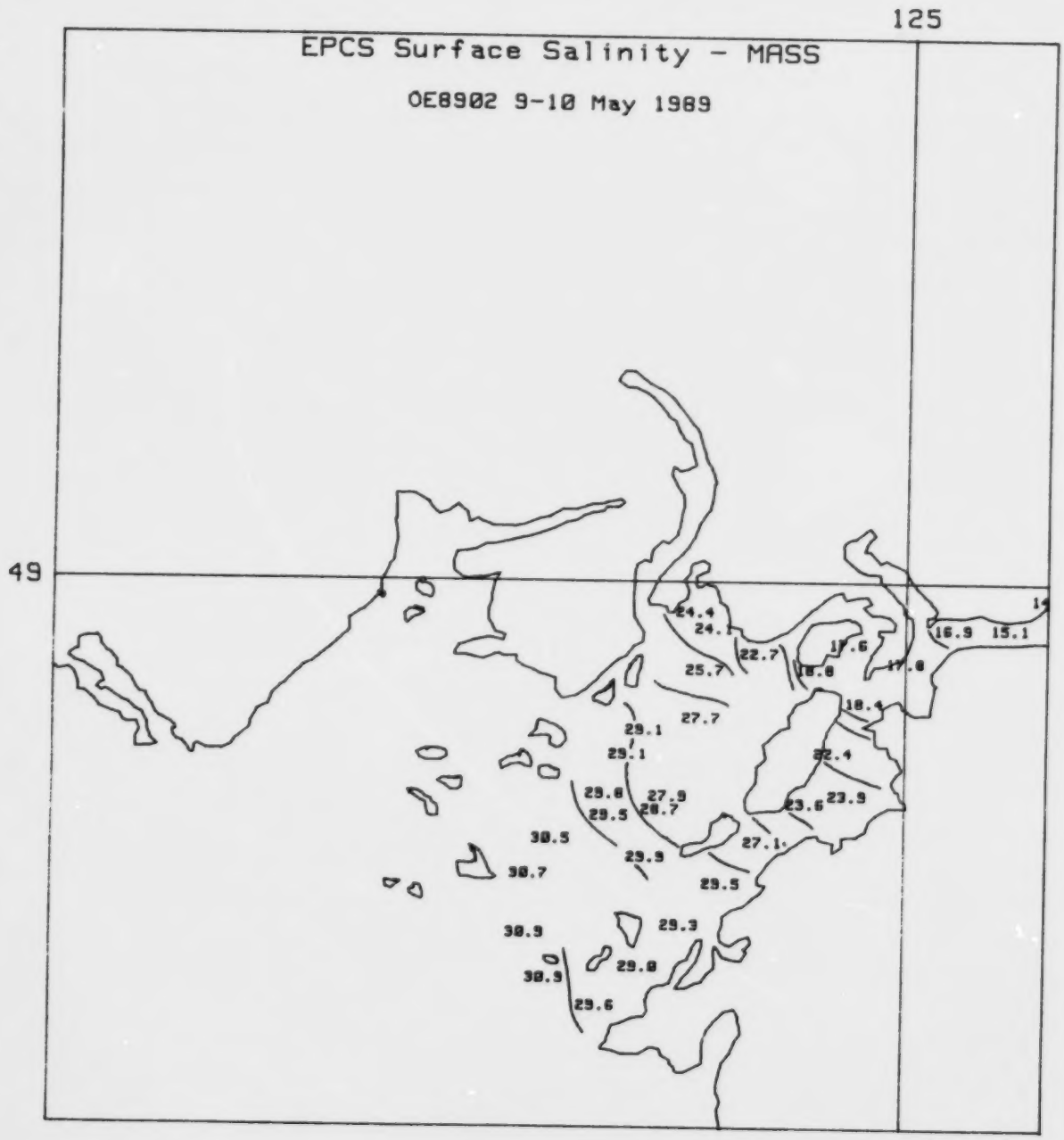


Fig. 14 OE8902 EPCS surface salinity 10 - 11 May 1989

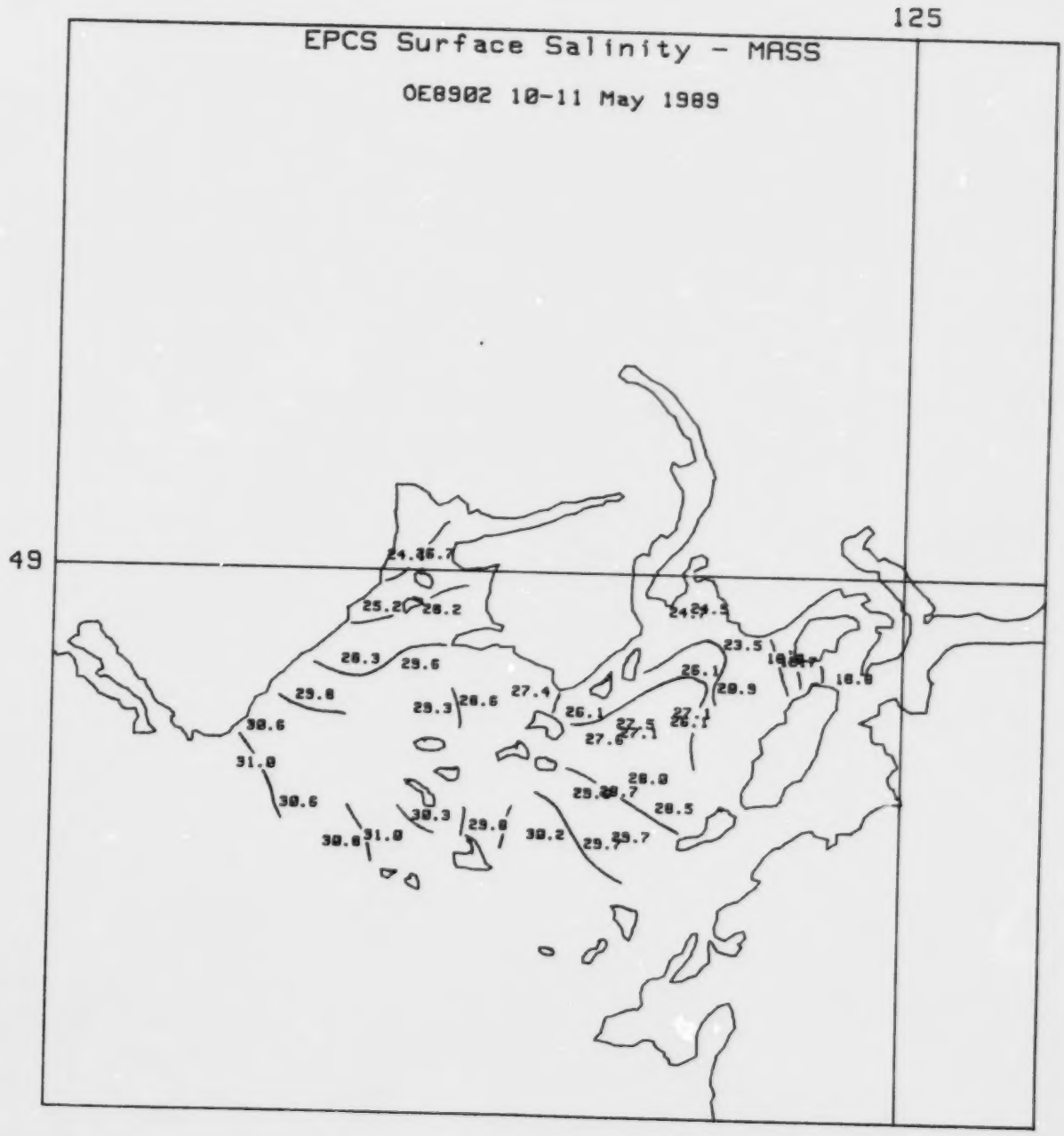


Fig. 15 OE8902 EPCS surface temperature 9 - 10 May 1989

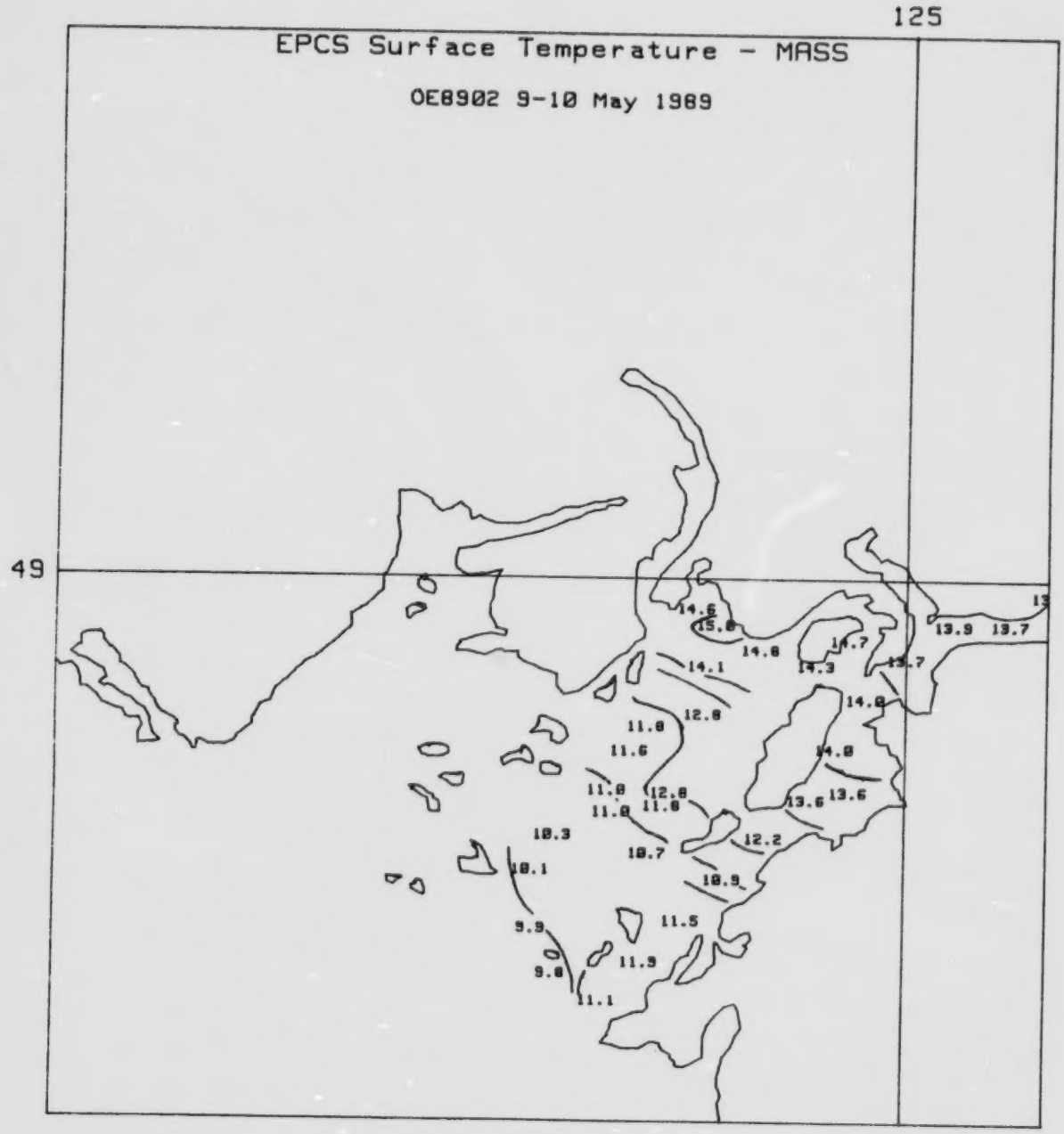


Fig. 16 OE8902 EPCS surface temperature 10 - 11 May 1989

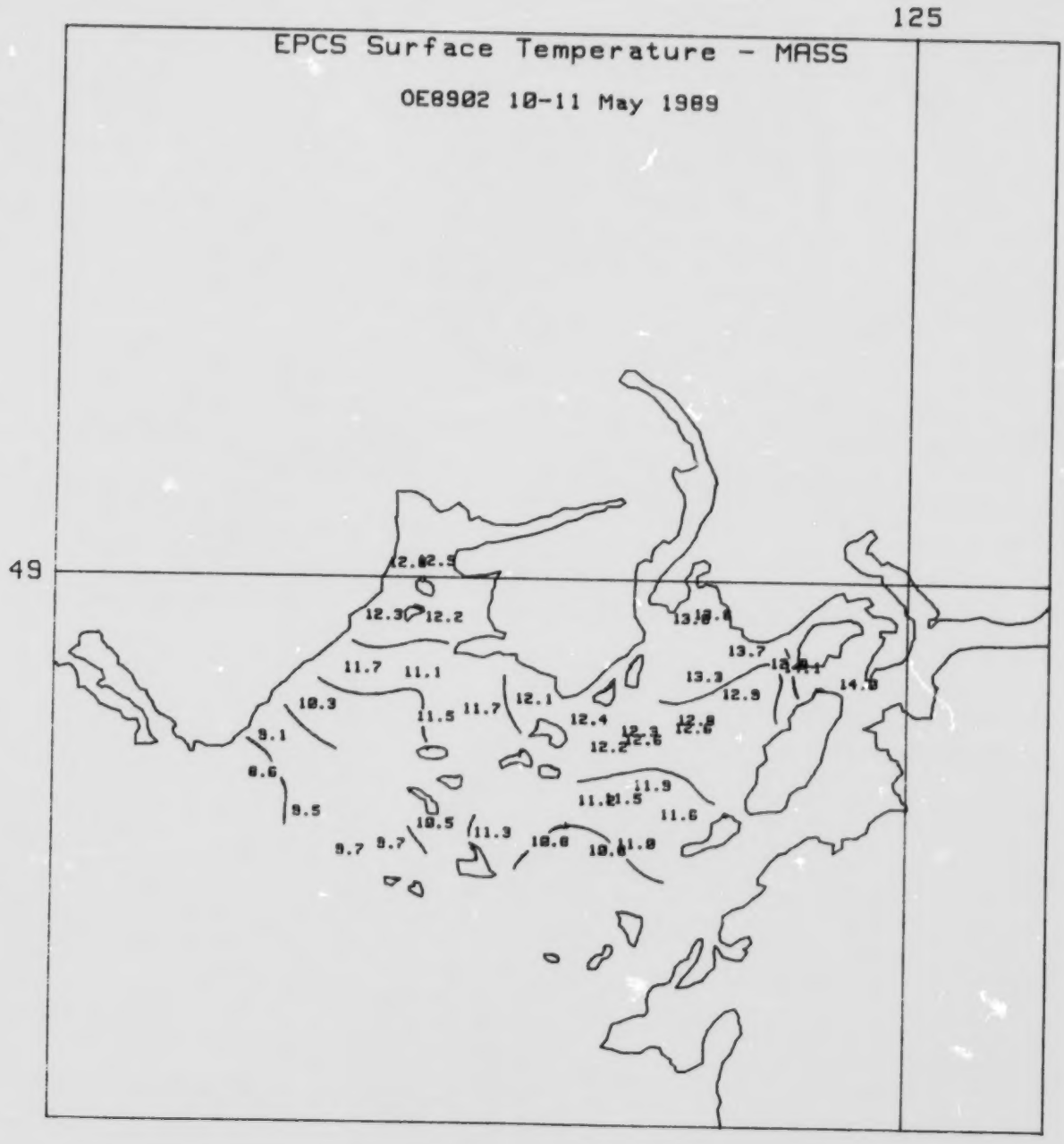


Fig. 17 OE8902 EPCS surface fluorescence 9 - 10 May 1989

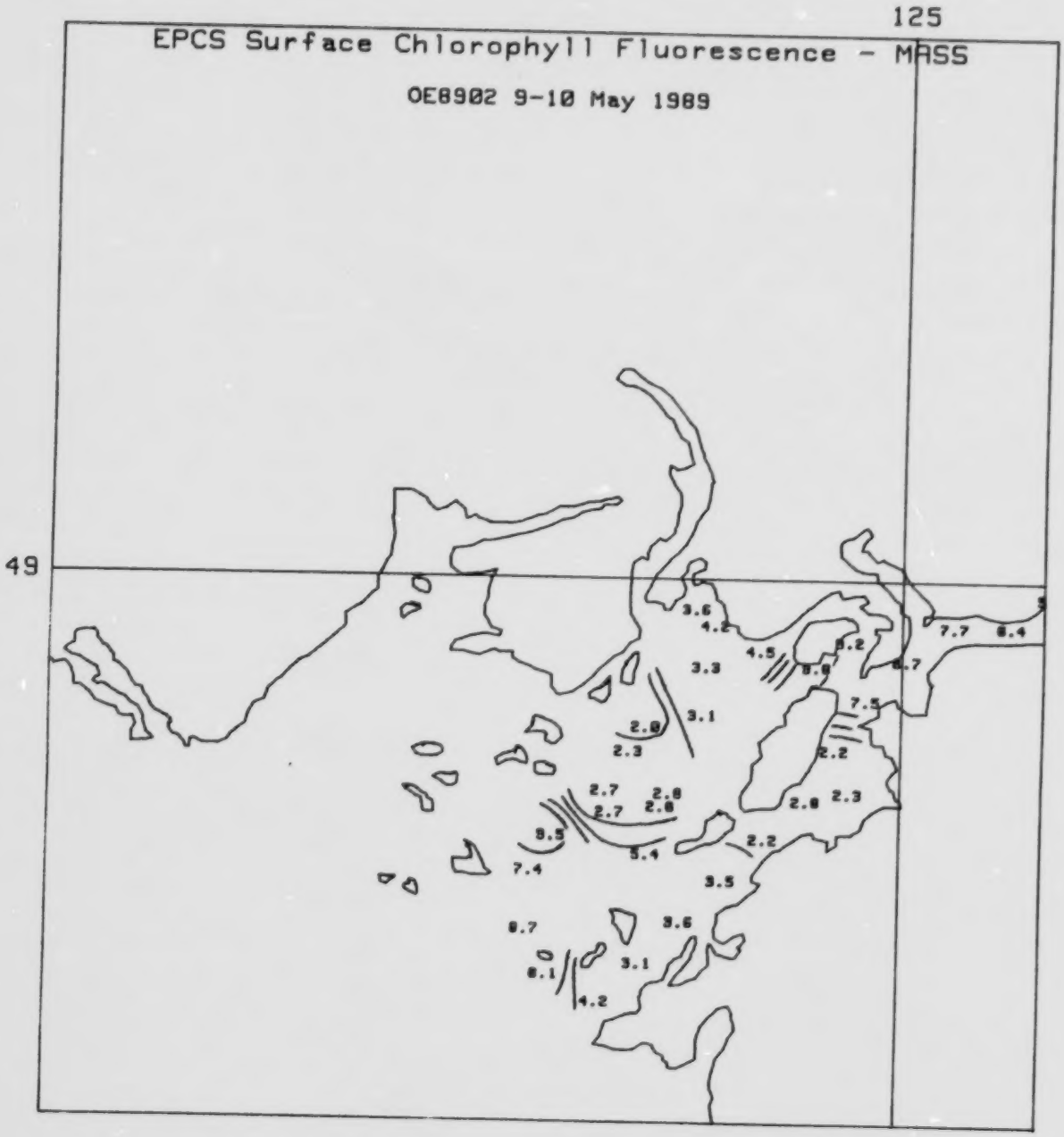


Fig. 18 OE8902 EPCS surface fluorescence 10 - 11 May 1989

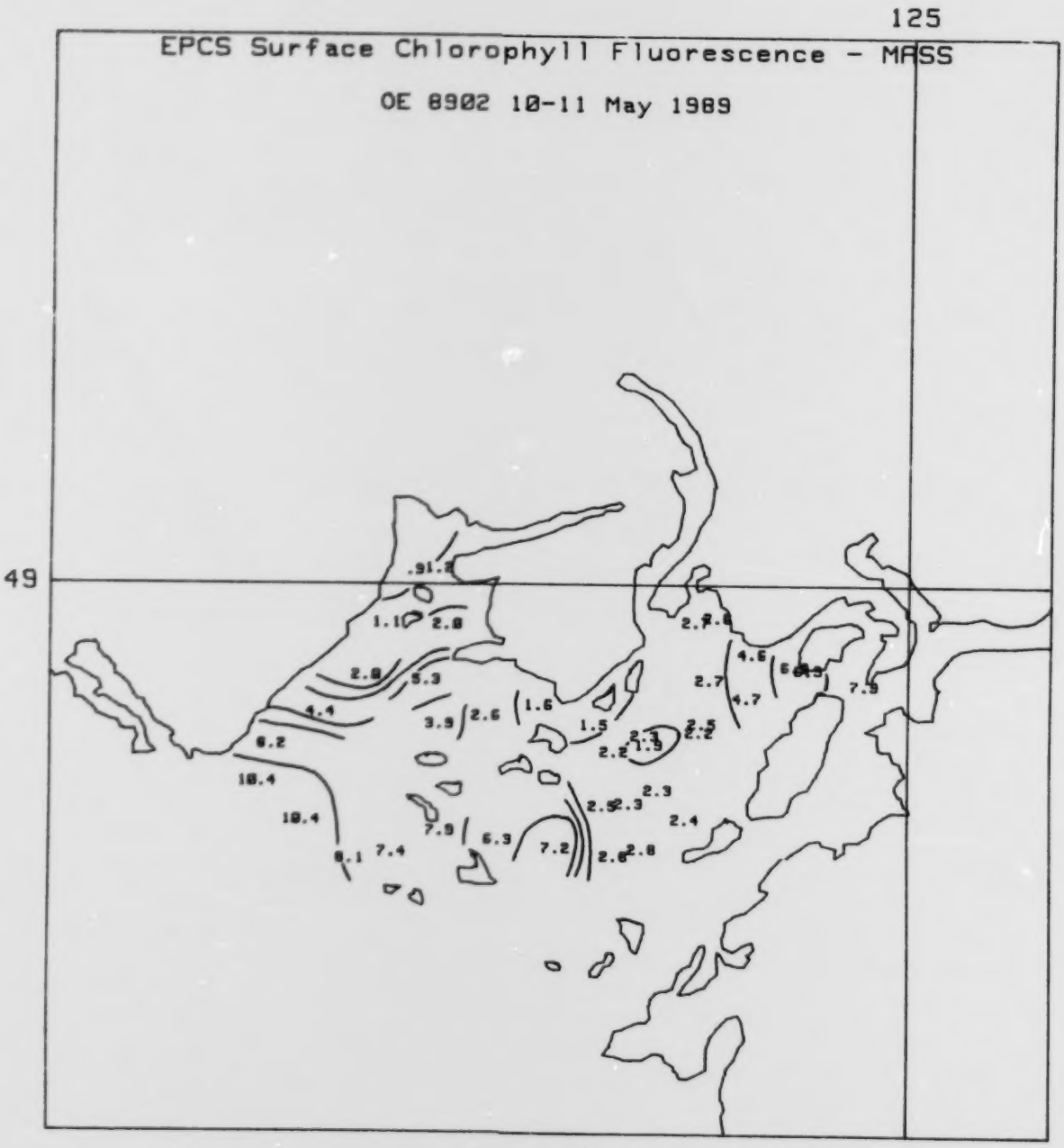


Fig. 19 OE8904 EPCS zooplankton biomass 9 - 10 June 1989

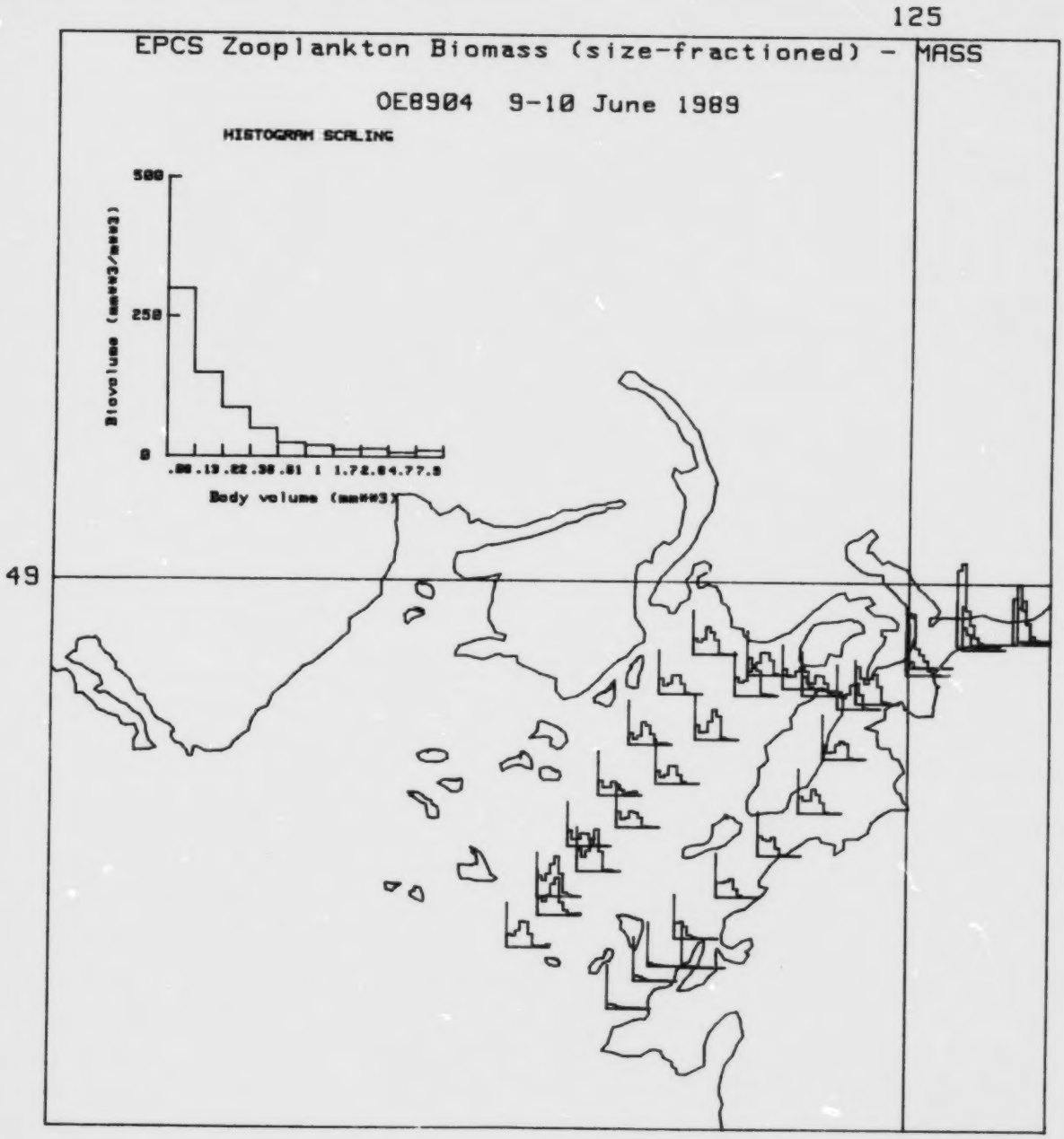


Fig. 20 OE8904 EPCS zooplankton biomass 10 - 11 June 1989

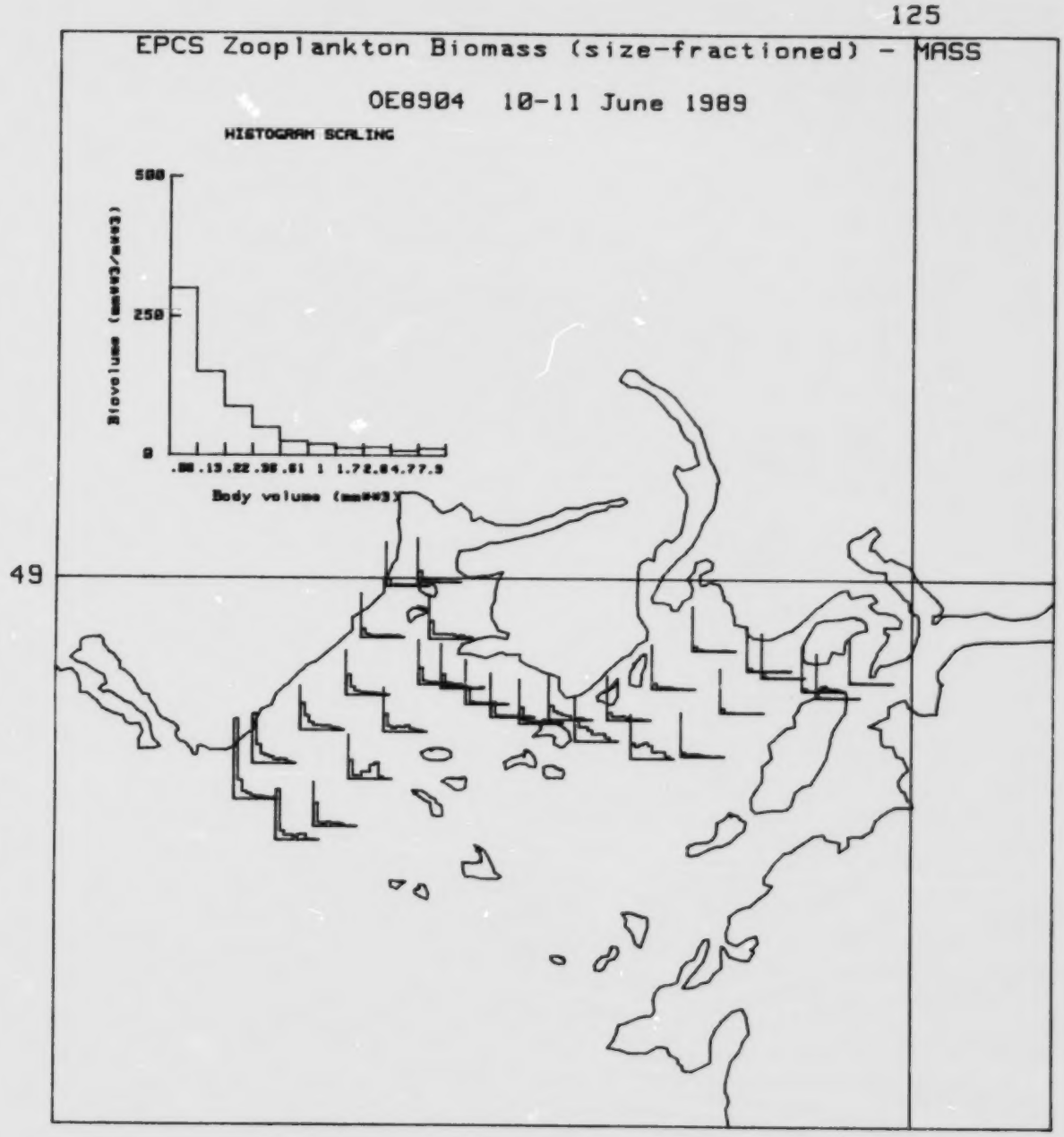


Fig. 21 OE8904 EPCS surface salinity 9 - 10 June 1989

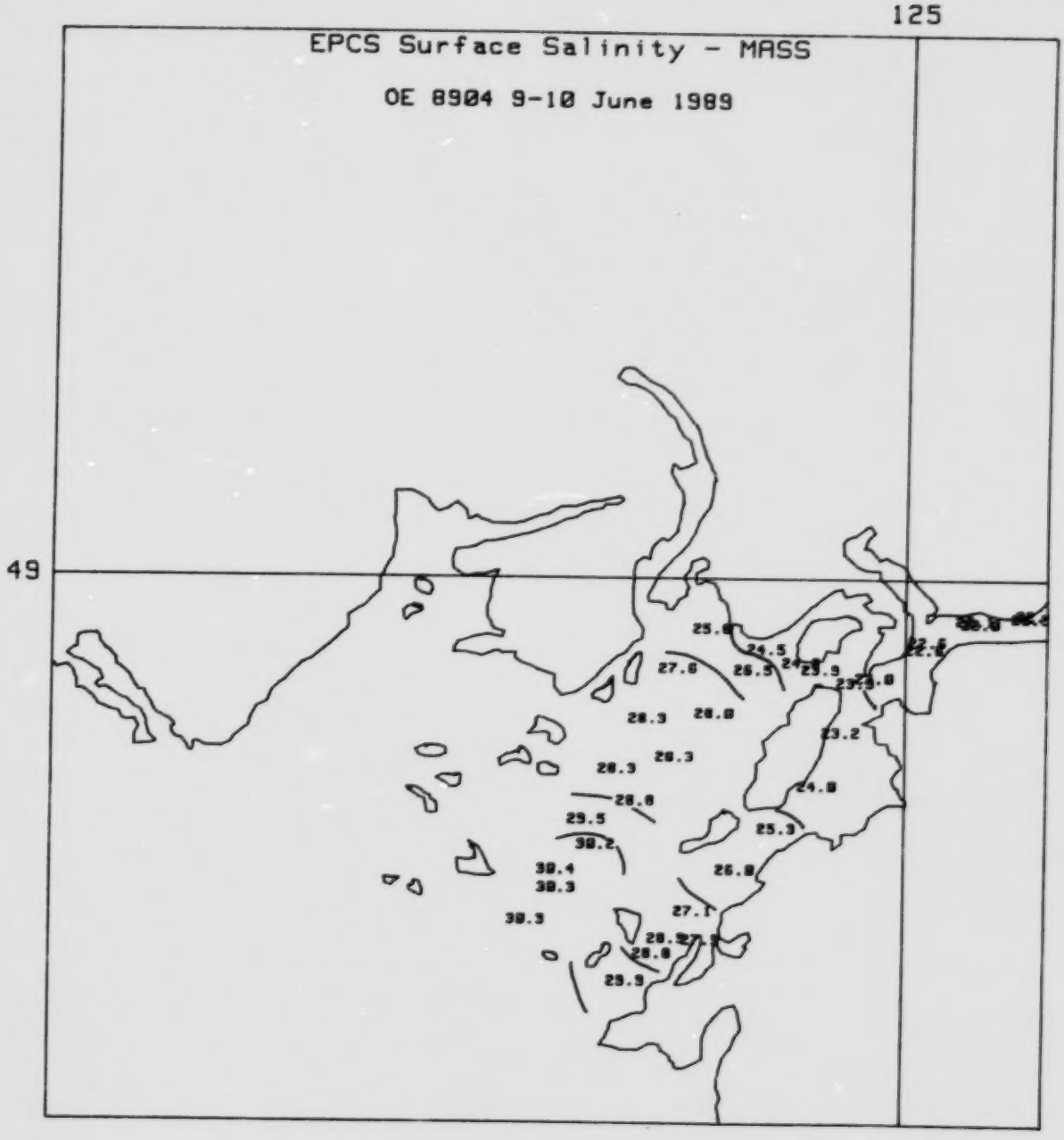


Fig. 22 OE8904 EPCS surface salinity 10 - 11 June 1989

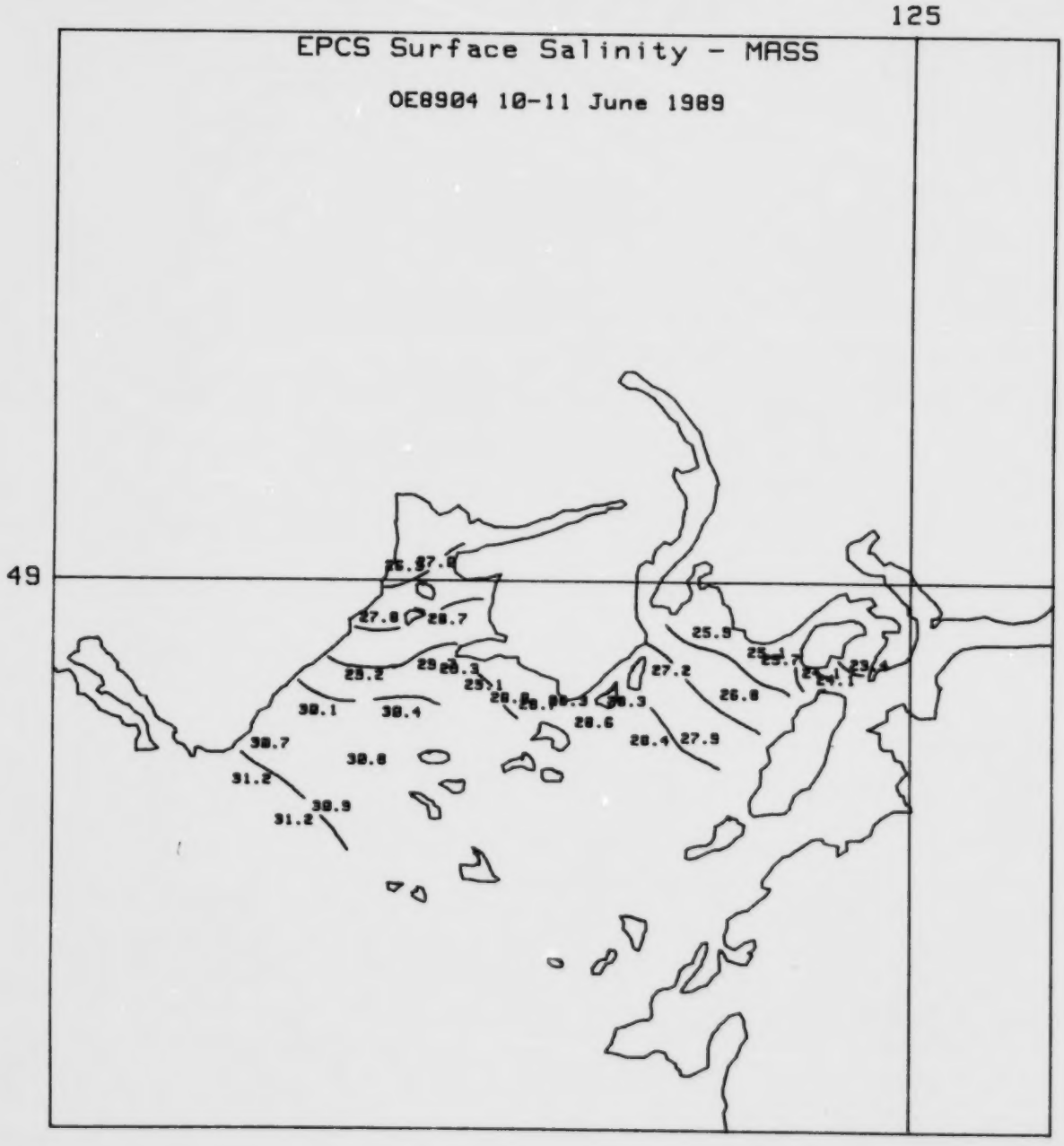


Fig. 23 OE8904 EPCS surface temperature 9 - 10 June 1989

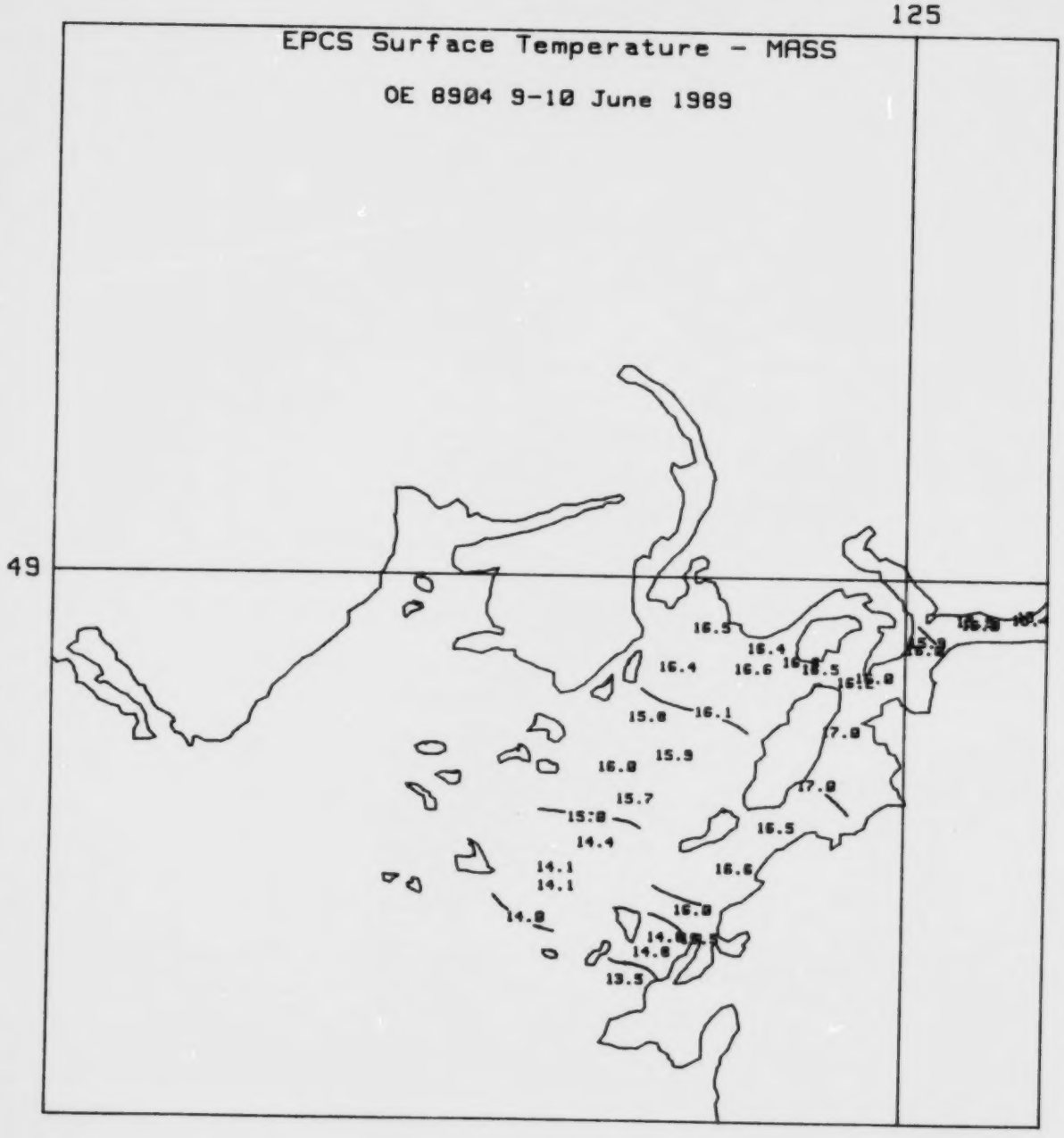


Fig. 24 OE8904 EPCS surface temperature 10 - 11 June 1989

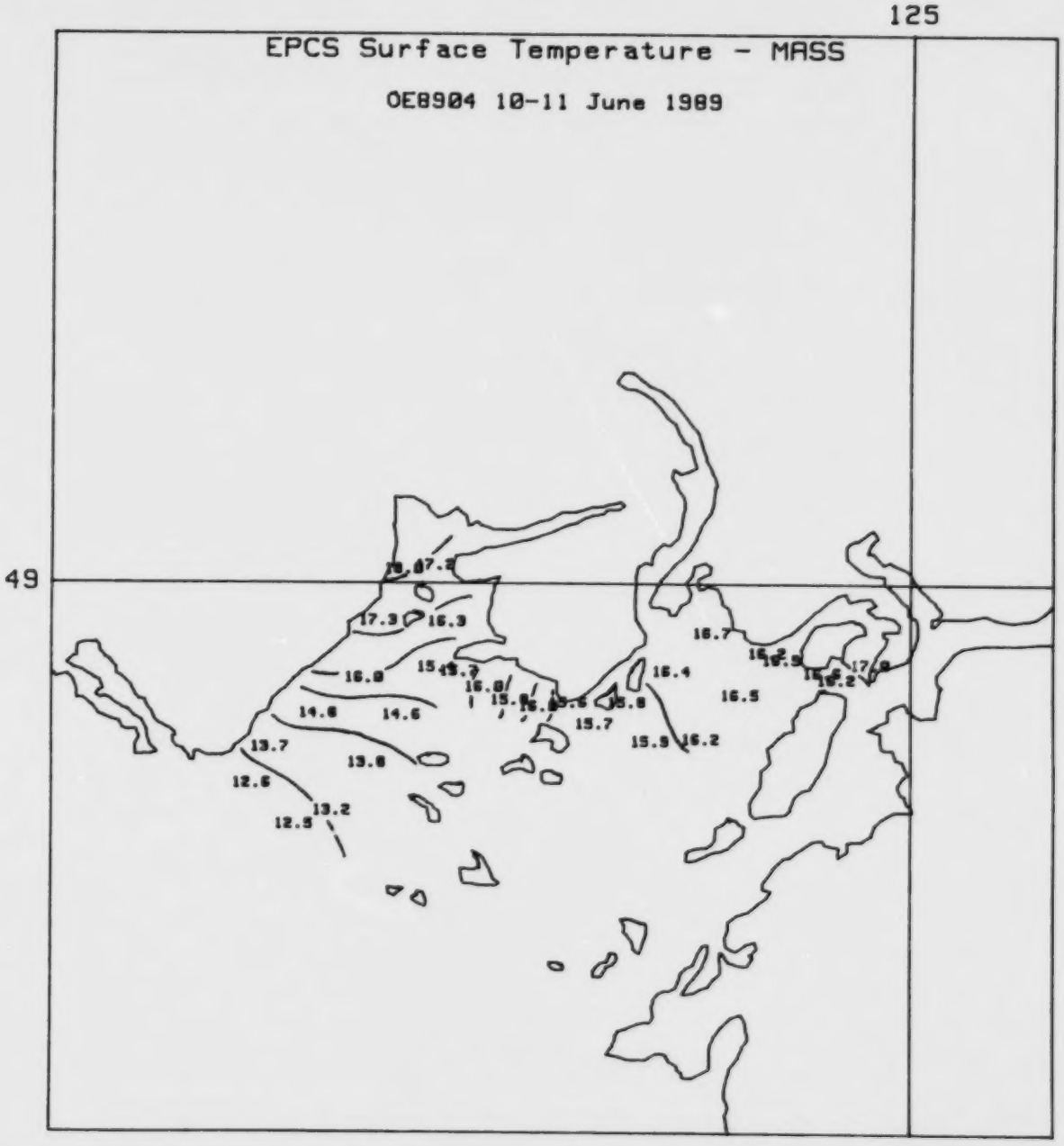


Fig. 25 OE8904 EPCS surface fluorescence 9 - 10 June 1989

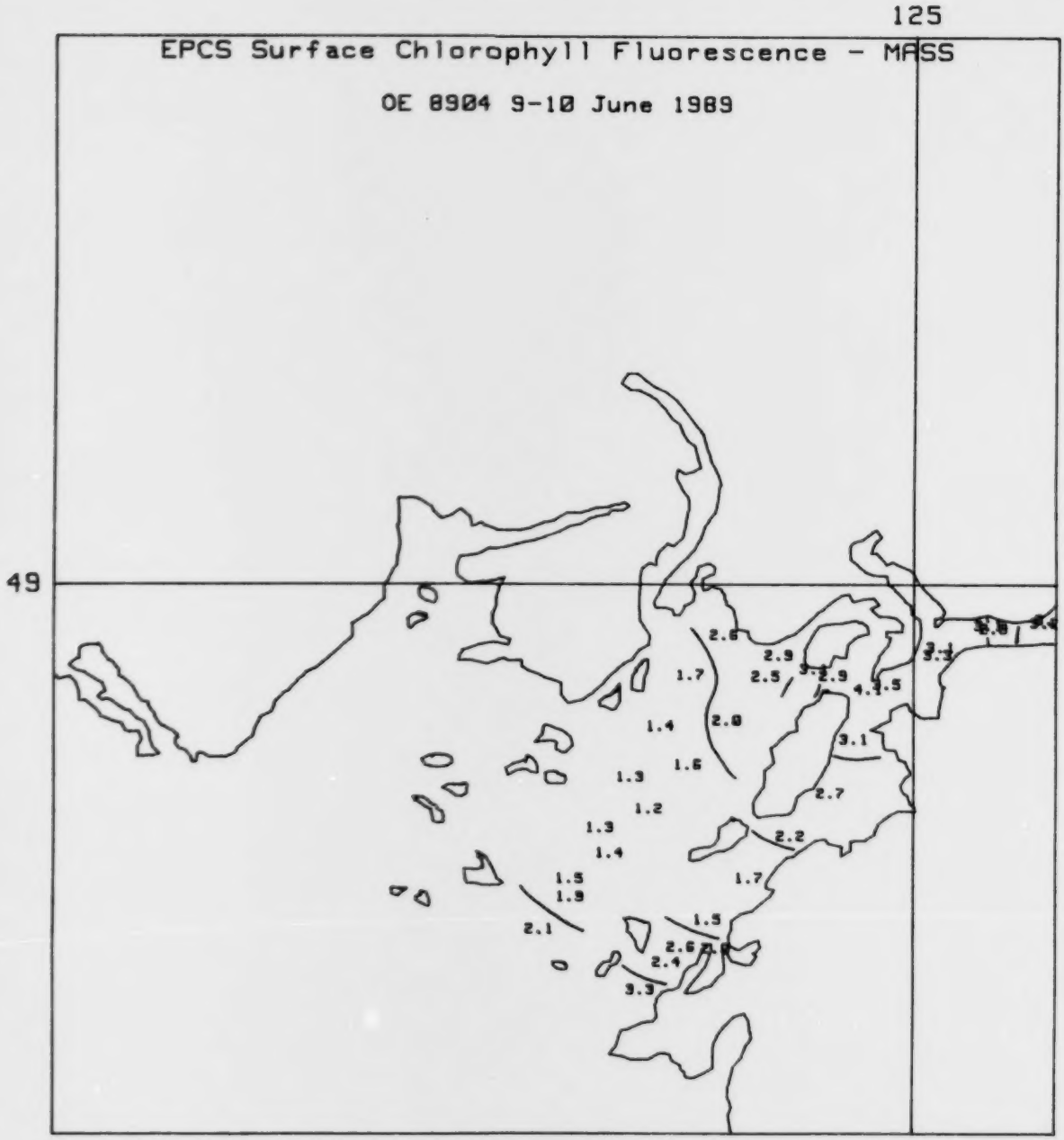
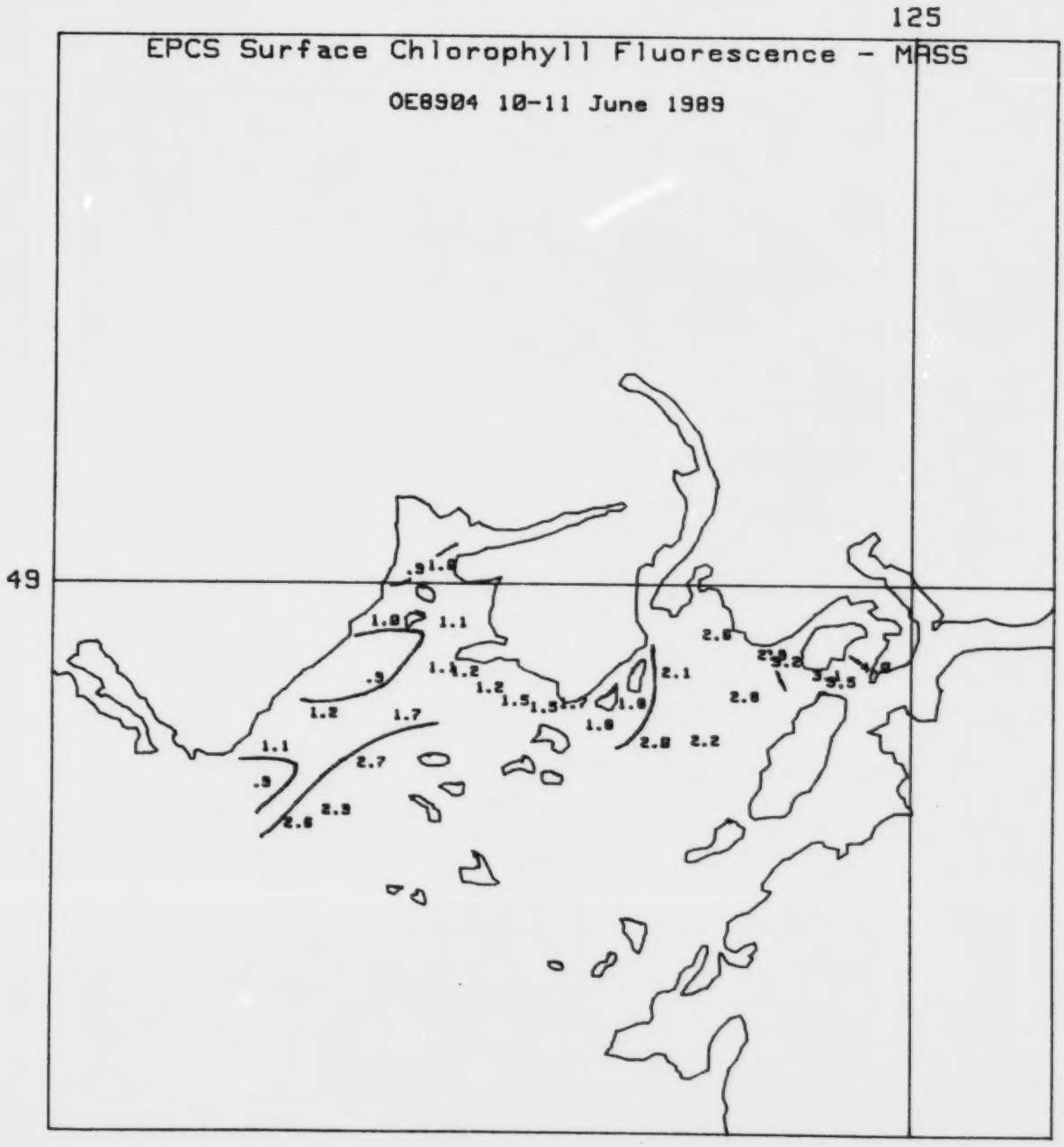


Fig. 26 OE8904 EPCS surface fluorescence 10 - 11 June 1989



DATA SECTION 4

DISCRETE WATER SAMPLE DATA AND CTD PROFILES

Table 4 OE8902 Discrete water sample data

Table 5 OE8904 Discrete water sample data

Fig. 27 OE8902 CTD plots

Fig. 28 OE8904 CTD plots

[—— CTD temperature
---- CTD salinity]

TABLE 4 OE8902 DISCRETE WATER SAMPLE DATA

Station	Bottle	Depth (m)	Salinity	Temp	Chl a (µg/L)	POC (µg/L)	PON (µg/L)	POC/PON	NO3 (µM/L)	PO4 (µM/L)	SiO4 (µM/L)
1	1	35	31.909 *	7.8 *	0.3				16.3	1.42	31.7
1	2	8	31.821 *	8.2 *	6.8	234.8	39.7	5.9	14.7	0.31	30.8
1	3	1	22.080 *	13.8 *	3.6	503.5	49.7	10.1	0.3	0.21	8.5
2	1	35	31.937	7.8 *	0.3	59.9	10.1	5.9	17.7	1.38	33.3
2	2	8	30.758 *	8.0 *	4.9	174.2	32.6	5.3	13.2	1.06	30.2
2	3	1	16.440 *	12.2 *	7.1	1222.7	76.8	15.9	0.0	0.06	16.0
3	1	35	31.911		0.4	40.4	7.5	5.4	16.8	1.64	35.4
3	2	8	31.901		1.4	86.8	19.2	4.5	14.9	0.04	33.6
3	3	1	30.858		12.6	1103.0	64.4	17.1	0.9	1.38	23.4
4	1	35	31.937	7.9 *	0.4	44.9	10.6	4.2	18.3	1.82	35.6
4	2	8	31.326 *	7.8 *	2.5	113.1	23.1	4.9	17.4	1.29	33.2
4	3	1	24.832 *	13.0 *	1.4	361.6	40.7	8.9	0.2	0.09	11.0
5	1	35	32.127		0.2	40.7	10.4	3.9	19.9	1.83	34.6
5	2	8	31.399		11.1	427.7	78.0	5.5	15.1	1.55	29.4
5	3	1	28.070		1.9	281.6	36.3	7.8	0.0	0.22	11.6
6	1	8	31.355		11.9	387.6	66.5	5.8	11.9	1.25	25.8
6	2	1	30.589		11.3	1207.0	112.6	10.7	0.0	0.15	5.1
7	1	20	31.516		2.4				16.9	1.69	40.6
7	2	8	30.929		5.8	705.3	65.4	10.8	0.1	0.51	12.6
7	3	1	27.482		1.0	289.2	30.1	9.6	0.0	0.08	1.5
8	1	35	31.937		0.4				17.2	1.87	38.2
8	2	8	31.078		46.4	1532.0	217.9	7.0	4.2	0.92	18.9
8	3	1	29.602		3.4	750.3	68.7	10.9	0.1	0.13	4.3
9	1	35	32.113		0.4				16.6	1.46	29.8
9	2	8	31.304		17.9	770.1	130.2	5.9	10.0	1.06	26.5
9	3	1	25.245		1.1	370.6	35.8	10.3	0.1	0.12	3.8

* Data from CTD

Station	Bottle	Depth (m)	Salinity	Temp	Chl a (ug/L)	POC (ug/L)	PON (ug/L)	NO3 (uM/L)	PO4 (uM/L)	SiO4 (uM/L)
C 1	Bucket	0	22.674	14.6	3.7			0.0	0.02	8.2
C 2	Bucket	0	25.340	14.0	3.4			0.3	0.26	6.1
C 3	Bucket	0	29.940	11.0	2.9			0.3	0.28	12.0
C 4	Bucket	0	30.275	10.4	9.0			4.9	0.63	15.6
C 5	Bucket	0	29.297	10.8	5.8			1.5	0.73	14.3
C 6	Bucket	0	22.723	13.2	2.9			0.5	0.20	8.4
C 7	Bucket	0	15.232	13.5	9.6			0.0	0.06	16.9
C 8	Bucket	0	12.531		12.8			0.0	0.15	22.4
C 9	Bucket	0	9.547	13.6	13.1			0.0	0.50	27.7
C 10	Bucket	0	5.352	14.2	10.3			0.0	0.13	36.5
C 11	Bucket	0	2.838	14.1	3.9			1.1	0.15	38.9
C 12	Bucket	0	19.298	13.8	5.0			0.1	0.27	9.2
C 13	Bucket	0	27.770	11.8	1.8			0.0	0.29	8.6
C 14	Bucket	0	29.792	11.0	7.3			0.3	0.27	5.0
C 15	Bucket	0	30.435	9.7				1.0	0.45	8.1
C 16	Bucket	0	25.124	11.5	1.0			0.2	0.15	4.8
C 17	Bucket	0	27.723	11.8	1.0			0.0	0.09	1.3
C 18	Bucket	0	26.890	12.2	2.2			0.0	0.13	7.3

TABLE 5 OE8904 DISCRETE WATER SAMPLE DATA

Station	Bottle	Depth (m)	Salinity	Temp		Chl a (ug/L)	POC (ug/L)	PON (ug/L)	POC/PON	NO3 (uM/L)	PO4 (uM/L)	SiO4 (uM/L)
1	1	35	32.319			0.2	91.0	10.4	8.8	19.6	1.90	37.2
1	2	8	31.629			0.8	182.2	20.1	9.1	8.8	1.41	20.5
1	3	1	20.302			2.2	319.9	49.6	6.5	1.3	0.51	25.0
2	1	35	32.287	8.0	*	0.3	81.3	17.1	4.8	21.2	1.97	38.1
2	2	8	31.785	9.3	*	2.1	163.8	31.2	5.2	9.5	1.52	15.5
2	3	1	22.843	17.5	*	3.2	396.1	63.5	6.2	0.7	0.39	16.5
3	1	35	32.302	8.0	*	0.4	81.1	15.9	5.1	23.2	2.08	39.3
3	2	8	31.713	9.8	*	8.2	393.8	68.3	5.8	3.5	0.80	3.1
3	3	1	24.856	17.3	*	2.4	553.1	64.9	8.5	0.0	0.11	2.3
4	1	35	32.286	8.3	*	0.4	91.5	15.7	5.8	23.0	2.11	38.3
4	2	8	31.655	10.6	*	4.9	389.5	66.1	5.9	0.5	0.47	2.9
4	3	1	28.363	14.9	*	1.2	438.4	50.0	8.8	0.0	0.06	0.4
5	1	35	32.224	8.3	*	0.8	105.5	21.9	4.8	19.9	2.32	8.1
5	2	8	31.628	9.9	*	2.1	261.4	50.7	5.2	2.4	0.83	0.8
5	3	1	28.749	16.2	*	1.3	387.6	56.7	6.8	0.0	0.19	43.0
6	1	24	32.027	8.1	*	0.4	103.7	19.6	5.3	15.2	2.21	37.4
6	2	8	31.462	10.0	*	1.8	133.9	26.0	5.1	0.0	0.34	7.7
6	3	1	25.459	18.2	*	1.2	243.5	39.5	6.2	0.0	0.07	4.2
7	1	27	32.140	8.9	*	0.8	67.4	13.9	4.9	16.9	1.85	30.8
7	2	8	31.806	9.8	*	9.1	303.3	63.1	4.8	9.3	1.36	16.3
7	3	1	30.587	14.2	*	2.8	524.8	58.2	9.0	0.0	0.27	1.2
8	1	35	32.266	8.0	*	0.3	72.4	14.1	5.2	22.9	1.61	37.2
8	2	8	31.883	9.7	*	20.7	723.7	136.0	5.3	4.5	0.92	4.4
8	3	1	29.903	14.1	*	1.2	331.5	46.2	7.2	0.0	0.20	0.8
9	1	35	32.324	8.0	*	0.3	46.7	10.1	4.6	20.7	0.61	41.3
9	2	8	31.769	9.3	*	0.9	102.9	25.2	4.1	8.7	1.42	14.0
9	3	1	26.918	15.5	**	2.0	305.5	56.0	5.5	0.0	0.22	4.4

* Data from CTD

Station	Bottle	Depth (m)	Salinity	Temp	Chl a (ug/L)	POC (ug/L)	PON (ug/L)	NO3 (uM/L)	PO4 (uM/L)	SiO4 (uM/L)
C 1	Bucket	0	30.330		4.9			1.6	0.63	4.2
C 2	Bucket	0	25.916	16.2	1.5			0.0		1.2
C 3	Bucket	0	23.614	15.8	3.6			0.0	0.30	8.7
C 4	Bucket	0	28.584	15.2	1.0			0.0	0.23	0.6
C 5	Bucket	0	30.180	13.7	2.1			0.2	0.29	0.8
C 6	Bucket	0	28.025	15.5	1.2			0.0	0.24	0.6
C 7	Bucket	0	23.259	15.7	3.5			0.0	0.34	13.4
C 8	Bucket	0	21.523	14.7	2.0			1.2	0.66	23.1
C 9	Bucket	0	22.856	15.5	3.9			0.2	0.38	18
C 10	Bucket	0	28.052	15.2	2.0			0.0	0.23	0.6
C 11	Bucket	0	29.276	15.4	1.4			0.0	0.29	1
C 12	Bucket	0	30.742	13.3	2.8			0.0	0.67	0.8
C 13	Bucket	0	31.028	12.7	0.7			0.1	0.44	1.9
C 14	Bucket	0	28.093	16.3	1.2			0.0	0.37	1.7
C 15	Bucket	0	28.513	16.0	1.3			0.0	0.36	0.8
C 16	Bucket	0	27.544	15.8	1.3			0.0	0.14	0.8

Fig. 27 OE8902 CTD plots

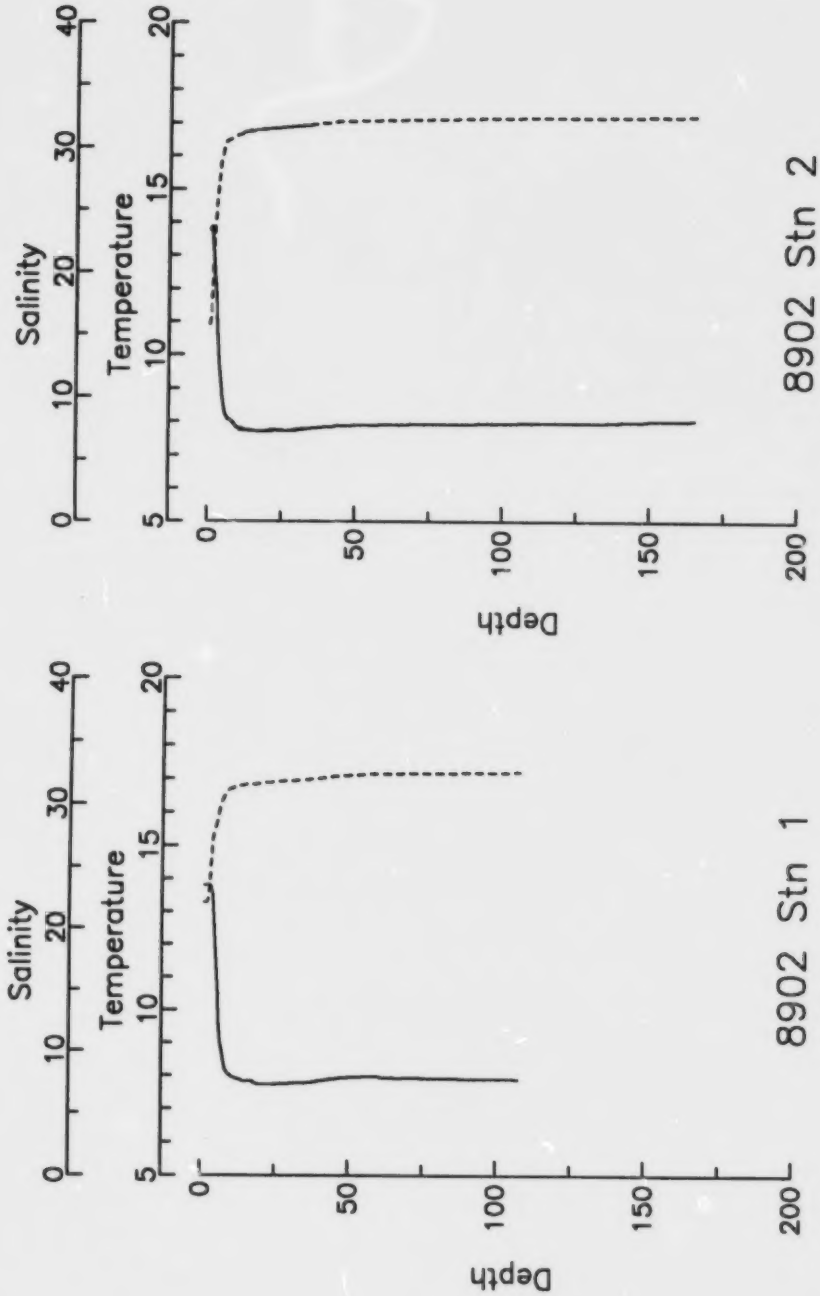


Fig. 27 (cont.)

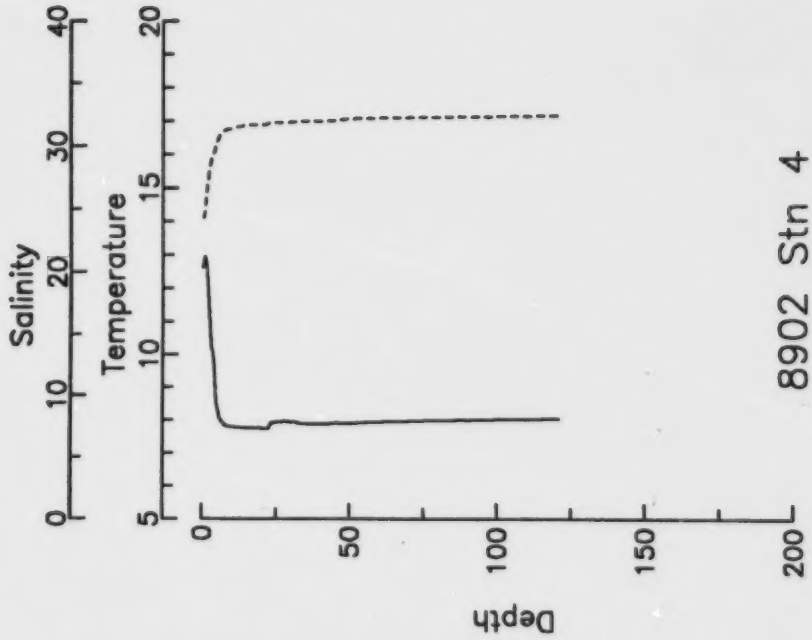

Salinity
0
10
20
30
40
Temperature
5
10
15
20
Depth
0
50
100
150
200
8902 Stn 4

Fig. 28 OE8904 CTD plots

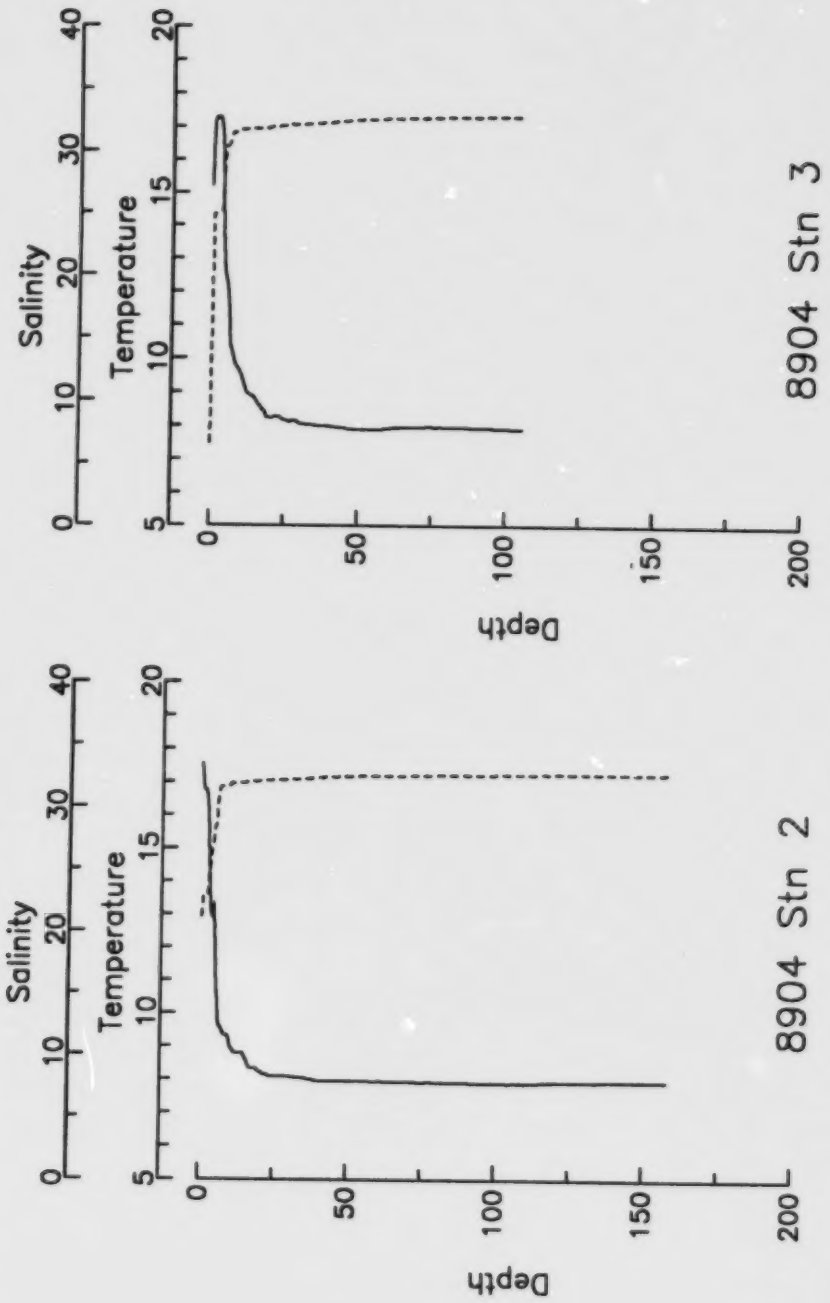


Fig. 28 (cont.)

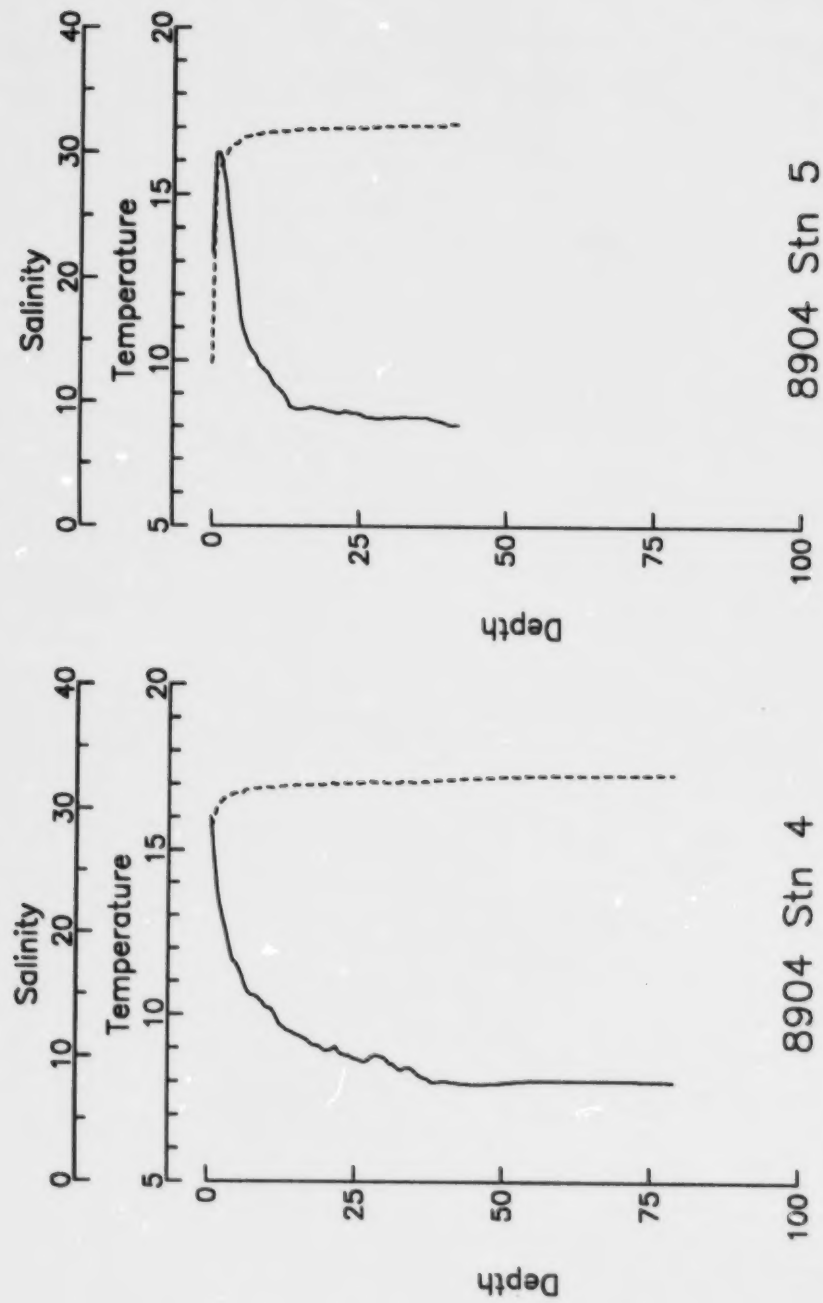
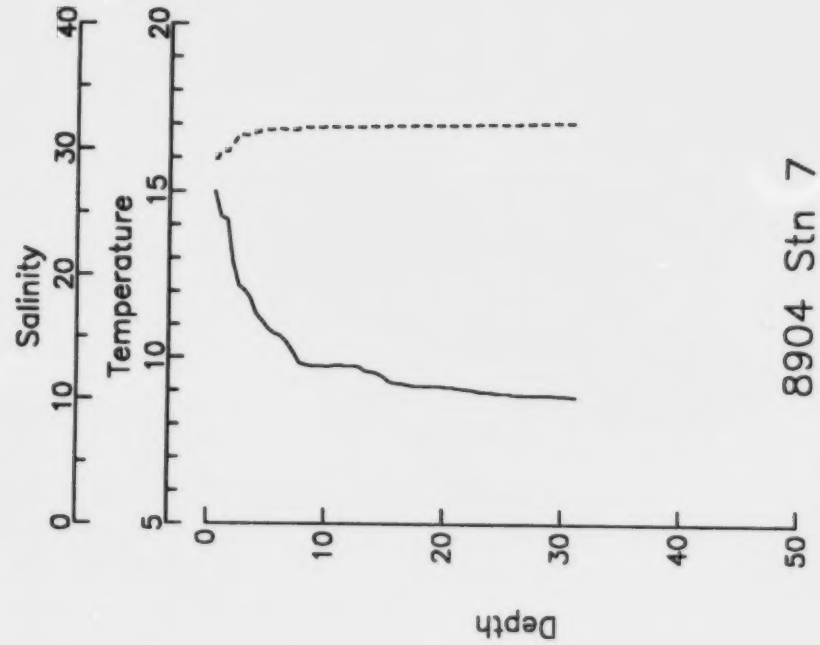

Salinity
0
10
20
30
40
Temperature
5
10
15
20
Depth
0
25
50
75
100
8904 Stn 5
8904 Stn 4

Fig. 28 (cont.)


Salinity
0
10
20
30
40
Temperature
5
10
15
20
Depth
0
10
20
30
40
50
8904 Stn 7

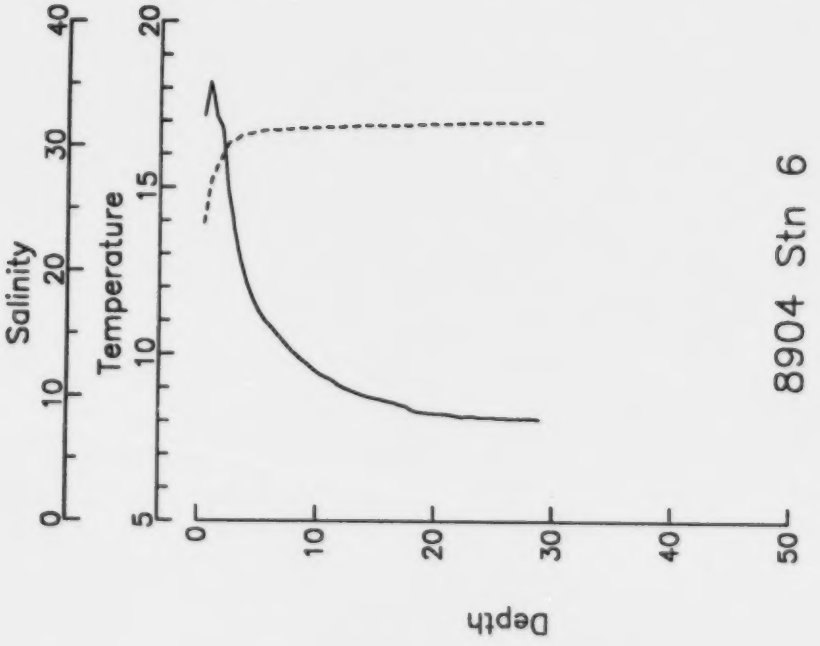
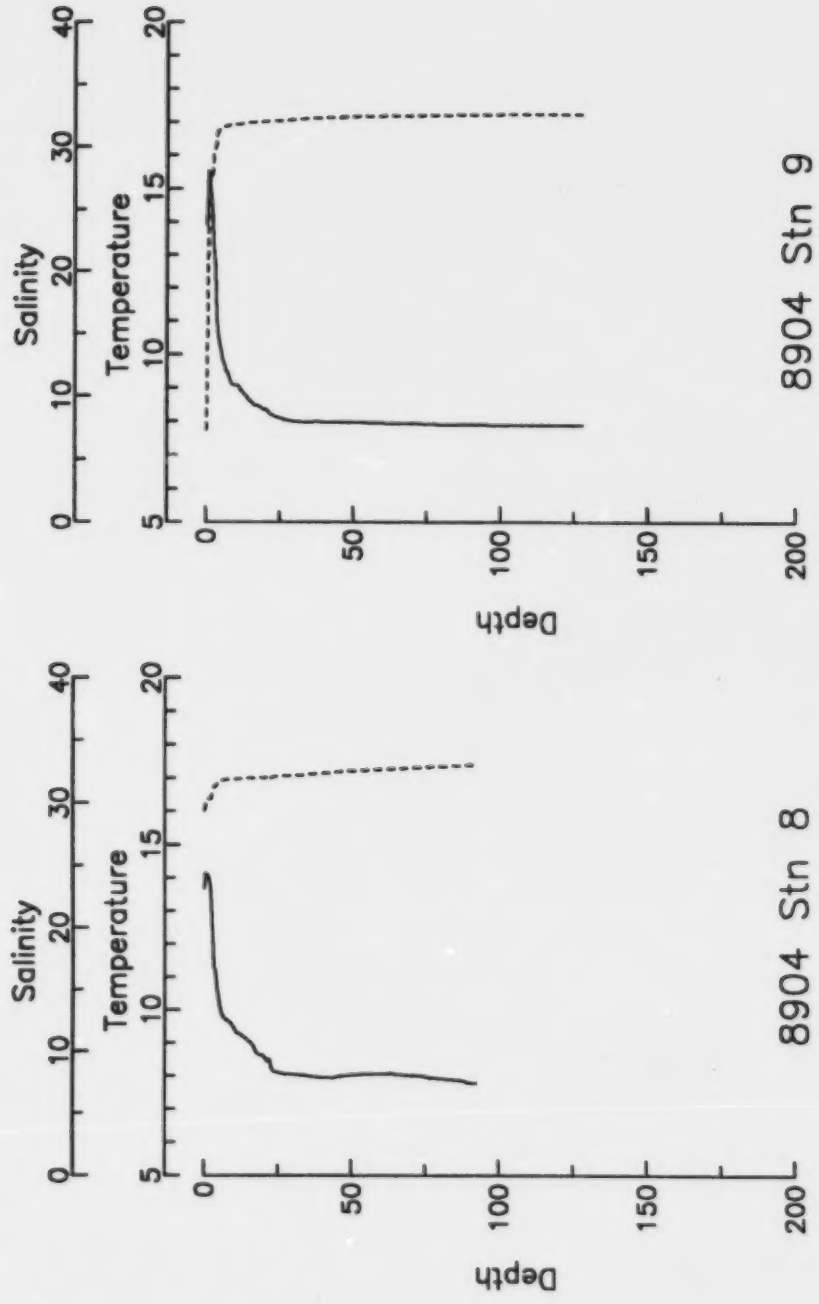

Salinity
0
10
20
30
40
Temperature
5
10
15
20
Depth
0
10
20
30
40
50
8904 Stn 6

Fig. 28 (cont.)



DATA SECTION 5

BACTERIA ABUNDANCE

Table 6 OE8902 Bacteria abundance and frequency of dividing cells

Table 7 OE8904 Bacteria abundance and frequency of dividing cells

TABLE 6 OE8902 BACTERIA ABUNDANCE AND FREQUENCY OF DIVIDING CELLS

Concentrations in cells.ml-1 x 10^-5

Std = 1 standard deviation of the concentration

Station	Bottle	Depth	Concentration	% Div.	Std
1	1	35	1.4	20	0.08
	2	8	0.9	14	0.08
	3	1	0.6	15	0.03
2	1	35	1.2	19	0.02
	2	8	0.6	14	0.02
	3	1	0.7	15	0.02
3	1	35	1.4	18	0.03
	2	8	0.3	8	0.02
	3	1	0.2	14	0.02
4	1	35	1.0	14	0.04
	2	8	0.3	11	0.02
	3	1	0.6	18	0.03
5	1	35	0.3	12	0.02
	2	8	0.3	13	0.03
	3	1	0.9	17	0.03
6	1	8	0.4	10	0.04
	2	1	0.3	7	0.01
7	2	8	0.1	11	0.02
	3	1	0.1	9	0.01
8	1	35	0.2	11	0.01
	2	8	0.2	10	0.01
	3	1	0.1	16	0.01
9	2	8	0.5	11	0.02
	3	1	1.3	20	0.01

TABLE 7 OE8904 BACTERIA ABUNDANCE AND FREQUENCY OF DIVIDING CELLS

Concentrations in cells.ml-1 x 10^-5

Std = 1 standard deviation of the concentration

Station	Bottle	Depth	Concentration	% Div.	Std
1	1	35	1.0	19	0.4
	2	8	1.4	17	0.3
	3	1	2.3	16	0.4
2	1	35	1.0	19	0.4
	2	8	2.0	20	0.2
	3	1	1.8	12	0.7
3	1	35	1.2	13	0.5
	2	8	2.1	19	0.4
	3	1	2.2	12	0.5
4	1	35	1.1	20	0.3
	2	8	1.1	10	0.2
	3	1	2.1	8	0.5
5	1	35	1.3	18	0.3
	2	8	2.0	14	0.3
	3	1	1.6	9	0.4
6	1	24	0.9	12	0.3
	2	8	1.9	10	0.3
	3	1	2.2	13	0.0
7	1	27	1.7	15	0.1
	2	8	1.9	7	0.4
	3	1	1.9	8	0.2
8	1	35	1.4	20	0.3
	2	8	2.2	10	0.1
	3	1	2.9	15	0.9
9	1	35	1.6	14	0.3
	2	8	1.7	11	0.1
	3	1	2.3	9	0.2

DATA SECTION 6

PHYTOPLANKTON IDENTITY AND ABUNDANCE

Table 8 Phytoplankton taxonomic list

Table 9 OE8902 Phytoplankton identity and abundance

Table 10 OE8904 Phytoplankton identity and abundance

TABLE 8 PHYTOPLANKTON TAXONOMIC LIST (WITH ABBREVIATIONS USED IN DATA RECORDS)

	Abbreviations in data records	
Cyanobacteria		
Cyanophyceae		
Chroococcales		
Chroococcaceae		
Synechococcus spp.	synechoccc spp.	
Nostocales		
Nostocaceae		
Anabaena spp.	anabaena spp.	
Chrysophyta		
Chrysophyceae		
Solenicola setigera	solenicola setigera	
Ochromonadales		
Ochromonadaceae		
Ochromonas spp.	ochromonas spp.	
Dinobryaceae		
Dinobryon suecicum	dinobryon suecicum	
Dictyochales		
Dictyochaceae		
Dictyocha speculum	dictyocha speculum	
Chromulinales		
Pedinellaceae		
Apedinella spinifera	apedinella spinifera	
Pseudopedinella pyriformis	pseudopedi pyriformis	
Xanthophyta		
Xanthophyceae		
Heterochloridales		
Heterochloridaceae		
Olisthodiscus carterae	olisthodis carterae	
Mischococcales		
Pleurochloridaceae		
Meringosphaera mediterranea	meringosph mediterranea	
Haptophyta		
Haptophyceae		
Isochrysidales		
Gephyrocapsaceae		
Imantonia rotundata	imantonia rotundata	
Prymnesiales		
Prymnesiaceae		
Chrysochromulina sp.1	chrysochro sp.1	
C. spp. (4-5.5 um)	chrysochro spp.	4-5.5
C. spp. (6-10 um)	chrysochro spp.	6-10
C. spp. (10-15 um)	chrysochro spp.	10-15
Phaeocystaceae		
Phaeocystis pouchetii	phaeocysti pouchetii	

Bacillariophyta		
Bacillariophyceae		
Centrales		
Cymatosiraceae		
	Leyanella arenaria	leyanella arenaria
Leptocylindraceae		
	Schroederalla delicatula	schroedere delicatula
	Leptocylindrus spores spiny	leptocylin spores spiny
	Leptocylindrus danicus	leptocylin danicus
	L. minimus	leptocylin minimus
	L. mediterraneus	leptocylin mediterraneu
Coscinodiscaceae		
	Melosira sp. (10.5x4 um)	melosira sp. 10.5x4
	Melosira monoliformis	melosira moniliformis
	S. nipponica	stephanopy nipponica
	Skeletonema costatum	skeletonem costatum
	Thalassiosira spp.	thalassios spp.
	T. gravida (syn. T. rotula)	thalassios rotula
	T. angulata	thalassios angulata
	T. anguste-lineata	thalassios anguste-line
	T. binata	thalassios binata
	T. aestivalis	thalassios aestivalis
	T. nordenskioldii	thalassios nordenskiold
	T. pacifica	thalassios pacifica
	T. eccentrica	thalassios eccentrica
	T. mendiolana	thalassios mendiolana
	T. conferta	thalassios conferta
	T. weisflogii	thalassios weisflogii
	Coscinodiscus spp.	coscinodis spp.
	C. radiatus	coscinodis radiatus
Biddulphiaceae		
	Bidulphia aurita	bidulphia aurita
	Eucampia spp.	eucampia spp.
	E. zoodiacus	eucampia zoodiacus
	Cerataulina pelagica	cerataulin pelagica
	Ditylum brightwellii	ditylum brightwellii
Chaetoceraceae		
	Chaetoceros sp. 1	chaetocero sp.1
	C. sp. 2 (=sp.a)	chaetocero sp.a
	C. sp. 5 (=sp.g)	chaetocero sp.g
	C. sp. 6 (=sp.h)	chaetocero sp.h
	C. sp. 7 (=sp.i)	chaetocero sp.i
	C. sp. 8 (=sp.j)	chaetocero sp.j
	C. sp. 9 (=sp.k)	chaetocero sp.k
	C. sp. 10 (=sp.l)	chaetocero sp.l
	C. cf. affine v. circinalis	chaetocero cf.affine v.circinalis
	C. perpusillum	chaetocero cf.perpusill
	C. affine	chaetocero affine
	C. breve	chaetocero breve
	C. compressum	chaetocero compressum
	C. constrictum	chaetocero constrictum
	C. convolutum	chaetocero convolutum
	C. curvisetum	chaetocero curvisetum
	C. danicum	chaetocero danicum

	C. debile	chaetocero	debile	
	C. decipiens	chaetocero	decipiens	
	C. diadema	chaetocero	diadema	
	C. didymum	chaetocero	didymum	
	C. gracile	chaetocero	gracile	
	C. laciniosum	chaetocero	laciniosum	
	C. lorenzianum	chaetocero	lorenzianum	
	C. pseudocrinitum	chaetocero	pseudocrinit	
	C. radicans	chaetocero	radicans	
	C. septentrion	chaetocero	septentriona	
	C. socialis	chaetocero	socialis	
	C. teres	chaetocero	teres	
	C. vixvisibilis	chaetocero	vixvisibilis	
Bacteriastraceae				
	Bacteriastrum delicatula	bacteriast	delicatula	
Rhizosoleniaceae				
	Rhizosolenia alata f. gracillima	rhizosolen	alata	f.gracillima
	R. alata f. alata	rhizosolen	alata	f.alata
	R. delicatula	rhizosolen	delicatula	
	R. fragilissima	rhizosolen	fragilissima	
	R. fragilissima v. 1	rhizosolen	fragilissima	v.1
	R. hebetata f. semispina	rhizosolen	hebetata	f.semispina
	R. setigera	rhizosolen	setigera	
	R. stolterfothii	rhizosolen	stolterfothi	
Pennales				
Cymatocyraceae				
	Minutocellus scriptus	minuticell	scriptus	
Fragilariaceae				
	Fragilaria spp.	fragilaria	spp.	
	Synedra spp. (59x5 um)	synedra	spp.	59x5
	S. spp. (90-141x2-3 um)	synedra	spp.	90-141x2-3
	S. spp. (95-110 x 6 um)	synedra	spp.	95-110x6
	S. spp. (204 um)	synedra	spp.	204
	Asterionella glacialis	asterionel	glacialis	
	Thalassiothrix frauenfeldii	thalassiot	frauenfeldii	
	T. longissima	thalassiot	longissima	
	Thalassionema nitzschiodes	thalassion	nitzschoides	
	T. bacillaris	thalassion	bacillaris	
	Licmophora spp.	licmophora	spp.	
	L. abbreviata	licmophora	abbreviata	
	Tabellaria sp. (36-54x3.3 um)	tabellaria	sp.	36-54x3.3
	T. sp. (92-151x8 um)	tabellaria	sp.	92-151x8
Naviculaceae				
	Gyrosigma spp. and Pleurosigma spp.	gyrosigma	spp.	pleurosigma
	Pleurosigma angulatum	pleurosigm	angulatum	
	P. acutum	pleurosigm	acutum	
Nitzschiaceae				
	Nitzschia cylindriformis and N. pseudonana	nitzschia	cylindrus	pseudonana
	N. americana	nitzschia	americana	
	N. delicatissima	nitzschia	delicatissim	
	N. longissima	nitzschia	longissima	
	N. pungens	nitzschia	pungens	
	N. seriata	nitzschia	seriata	
	N. seriata v. obtusa	nitzschia	seriata	v.obtusa

	N. turgiduloides	nitzschia turgiduloide	
	N. bicapitata	nitzschia bicapitata	
	N. lineola	nitzschia lineola	
	N. closterium	nitzschia closterium	
	N. closterium v. stiatula	nitzschia closterium	v.striatula
	N. subfraudulenta	nitzschia subfraudulen	
	N. fraudulenta	nitzschia fraudulenta	
	N. cylindroformis	nitzschia cylindroform	
	N. impressa	nitzschia impressa	
	N. subcurvata	nitzschia subcurvata	
Bacillariaceae			
	Cylindrotheca fusiformis	cylindroth fusiformis	
Prasinophyta			
Prasinophyceae			
Pyramimonadales			
Nephroselmidaceae			
	Nephroselmis spp.	nephroselm spp.	
	Bipedinomonas spp.	bipedinomo spp.	
Polyblepharidaceae			
	Pyramimonas spp. (3-8 um)	pyramimona spp.	3-8
	Cymbomonas spp.	cymbomonas spp.	
Platymonadaceae			
	Platymonas sp.	platymonas sp.	
Halosphaerales			
Pterospermataceae			
	Pterosperma spp.	pterosperm spp.	
	P. spp. (0-5 um)	pterosperm sp.	0-5
	P. spp. (5-7 um)	pterosperm sp.	5-7
	P. spp. (>7 um)	pterosperm sp.	>7
	P. cristatum	pterosperm cristatum	
Euglenophyta			
Euglenophyceae			
Eutreptiales			
	Eutreptiella spp.	eutreptiel spp.	
Pyrrophyta			
Dinophyceae			
Prorocentrales			
Prorocentraceae			
	Prorocentrum sp. (14x11 um)	prorocentr sp.	14x11
	P. minimum v. balticum	prorocentr minimum	v.balticum
	P. balticum	prorocentr balticum	
	P. rotundatum	prorocentr rotundatum	
Dinophysiales			
Dinophysiaceae			
	Dinophysis spp.	dinophysis spp.	
	D. acuminata	dinophysis acuminata	
	D. ovum	dinophysis ovum	
Gymnodiniales			
Gymnodiniaceae			
	'Gonyaulax' rugosum	gonyaulax rugosum	
	Coohlodinium citron	coohlodini citron	
	G. sp. 3 (round) (6.6 - 10 um)	gymnodiniu sp.3	(round) 6.6-10
	G. sp. 5	gymnodiniu sp.5	

	G. simplex	gymnodiniu simplex
	G. flavum	gymnodiniu flavum
	G. gracilentum	gymnodiniu gracilentum
	G. agiliforme	gymnodiniu agiliforme
	G. inequale	gymnodiniu inequale
	G. paulseni	gymnodiniu paulseni
	Katodinium rotundatum	katodinium rotundatum
Peridiniales		
Peridiniaceae		
	Scripsiella & Glenodinium (20 - 25 um)	scripsiell spp. glenodinium 20-25
	S. spp. and G. spp. (25 - 30 um)	scripsiell spp. glenodinium 25-30
	S. sp. 2	scripsiell sp.2
	S. digitale	scripsiell digitale
	S. trochoidea	scripsiell trochoidea
	Glenodinium inequale	glenodiniu inequale
	Heterocapsa triquetra	heterocaps triquetra
Gonyaulaceae		
	Gonyaulax diagensis	gonyaulax diagensis
	G. digitale	gonyaulax digitale
Ceratiaceae		
	Ceratium lineatum	ceratium lineatum
Cryptophyta		
Cryptophyceae		
Cryptomonadales		
	spp. (5-10 um)	cryptomona spp. 5-10
	spp. (11-20 um)	cryptomona spp. 11-20
	spp. (21-30 um)	cryptomona spp. 21-30
	Isoselmis spp. and hemiselmis spp. (4-6 um)	isoselmis spp. hemiselmis 4-6
FLAGELLATES (autotrophic, unidentified)		
	sp. xiii	flagellate sp. xiii
	spp. (1-2 um)	flagellate spp. 1-2
	spp. (2-5 um)	flagellate spp. 2-5
	spp. (6-15 um)	flagellate spp. 6-15
Protozoa		
	Mesodinium rubrum	mesodinium rubrum

um - micrometres
syn - synonym
v. - variety
f. - form
cf. - similar to

TABLE 9 OE8902 PHYTOPLANKTON IDENTITY AND ABUNDANCE

Cruise 89-02

Total Abundance (no. litre)

Taxon	1-2	1 3	2 2	2-3
synechococ spp.	2.46E+06	1.77E+05	3.99E+05	1.94E+05
anabaena spp.	3.90E+04	6.50E+03	0.00E+00	2.90E+03
dinobryon suecicum	2.50E+03	3.30E+04	1.05E+04	1.42E+04
apedinella spinifera	4.00E+02	9.00E+02	0.00E+00	0.00E+00
pseudopedi pyriformis	3.00E+02	0.00E+00	0.00E+00	0.00E+00
meringosph mediterranea	0.00E+00	0.00E+00	3.00E+02	0.00E+00
imantonia rotundata	1.03E+06	3.61E+05	1.60E+05	1.04E+05
chrysochro sp.1	5.60E+03	4.37E+05	1.12E+04	4.48E+05
chrysochro spp. 4-5.5	4.48E+04	2.32E+05	5.60E+03	1.85E+05
chrysochro spp. 6-10	0.00E+00	5.04E+04	0.00E+00	1.12E+04
chrysochro spp. 15-20	0.00E+00	1.68E+04	0.00E+00	0.00E+00
phaeocysti pouchetii	5.80E+05	0.00E+00	5.20E+04	0.00E+00
leyanella arenaria	0.00E+00	0.00E+00	2.52E+04	0.00E+00
melosira sp. 10.5x4	0.00E+00	0.00E+00	0.00E+00	5.80E+03
melosira moniliformis	0.00E+00	1.00E+03	0.00E+00	2.70E+03
leptocylin danicus	1.70E+03	9.00E+02	4.00E+03	0.00E+00
leptocylin minimus	0.00E+00	1.40E+03	0.00E+00	2.00E+02
leptocylin mediterraneu	0.00E+00	0.00E+00	1.02E+04	0.00E+00
skeletonem costatum	2.39E+06	1.48E+07	2.29E+06	1.60E+08
thalassios rotula	0.00E+00	0.00E+00	3.00E+02	0.00E+00
thalassios angusto line	0.00E+00	0.00E+00	2.00E+02	0.00E+00
thalassios nordenskiold	4.00E+02	0.00E+00	1.20E+03	1.30E+03
thalassios pacifica	9.00E+03	5.20E+03	7.40E+03	9.00E+03
thalassios eccentrica	0.00E+00	0.00E+00	5.00E+02	0.00E+00
thalassios mendiolana	4.00E+02	0.00E+00	4.00E+02	3.00E+02
thalassios conferta	4.20E+03	2.00E+03	1.57E+04	0.00E+00
thalassios weisflogii	0.00E+00	6.35E+04	0.00E+00	9.75E+05
coscinodis radiatus	0.00E+00	0.00E+00	1.00E+02	0.00E+00
chaetocero sp.g	8.00E+02	4.30E+03	2.50E+03	1.43E+04
chaetocero sp.h	0.00E+00	0.00E+00	5.00E+02	0.00E+00
chaetocero sp.1	0.00E+00	7.20E+03	0.00E+00	5.20E+04
chaetocero compressum	0.00E+00	0.00E+00	3.10E+03	0.00E+00
chaetocero debile	3.62E+04	8.67E+04	2.14E+04	0.00E+00
chaetocero decipiens	0.00E+00	1.90E+03	0.00E+00	0.00E+00
chaetocero diadema	4.60E+03	1.88E+04	0.00E+00	0.00E+00

chaetocero radicans	0.00E+00	7.30E+03	9.00E+02	0.00E+00
chaetocero socialis	5.90E+03	6.30E+03	1.50E+03	0.00E+00
chaetocero teres	7.00E+02	5.00E+02	0.00E+00	0.00E+00
rhizosolen delicatula	4.00E+02	0.00E+00	0.00E+00	0.00E+00
rhizosolen fragilissima	1.50E+03	2.30E+03	6.00E+02	2.00E+02
rhizosolen fragilissima v.1	8.00E+02	5.60E+03	1.40E+03	0.00E+00
minuticell scriptus	6.00E+03	0.00E+00	6.60E+03	0.00E+00
synedra sp. 204	0.00E+00	0.00E+00	0.00E+00	2.00E+02
synedra sp. 90-141x2-3	0.00E+00	0.00E+00	0.00E+00	1.60E+03
synedra sp. 59x5	0.00E+00	0.00E+00	0.00E+00	6.00E+02
thalassion nitzschoides	5.31E+04	4.28E+04	2.40E+05	7.02E+04
thalassion bacillaris	0.00E+00	1.60E+03	0.00E+00	0.00E+00
licmophora abbreviata	4.00E+02	0.00E+00	0.00E+00	2.00E+02
tabellaria sp. 36-59x3.3	0.00E+00	0.00E+00	0.00E+00	1.70E+03
tabellaria sp. 92-151x8-1	0.00E+00	0.00E+00	0.00E+00	1.20E+03
nitzschia cylindrus pseudonana	0.00E+00	1.36E+04	0.00E+00	0.00E+00
nitzschia americana	0.00E+00	0.00E+00	3.18E+04	4.00E+02
nitzschia delicatissim	3.14E+04	1.57E+04	1.70E+03	2.50E+03
nitzschia longissima	2.10E+03	0.00E+00	0.00E+00	0.00E+00
nitzschia pungens	1.70E+03	3.60E+03	1.60E+03	0.00E+00
nitzschia bicapitata	4.00E+02	0.00E+00	1.80E+03	0.00E+00
nitzschia closterium	5.00E+02	1.00E+03	3.00E+02	2.00E+02
nitzschia closterium v.striatula	2.00E+03	1.10E+03	6.00E+02	0.00E+00
nitzschia cylindroform	5.22E+04	0.00E+00	3.25E+04	0.00E+00
nitzschia subcurvata	4.20E+03	0.00E+00	8.00E+02	0.00E+00
cymbomonas spp.	0.00E+00	2.70E+03	0.00E+00	3.00E+02
bipedinomo spp.	0.00E+00	0.00E+00	1.96E+04	1.40E+04
pyramimona spp. 3 8	6.00E+02	4.00E+03	2.50E+03	2.00E+02
pterosperm spp.	0.00E+00	0.00E+00	0.00E+00	1.00E+02
eutreptiel spp.	0.00E+00	0.00E+00	3.00E+02	0.00E+00
scripsiell spp. glenodinium 20 25	0.00E+00	1.30E+03	0.00E+00	1.00E+02
scripsiell spp. glenodinium 25 30	0.00E+00	3.00E+03	0.00E+00	2.00E+02
gymnodiniu sp.3 (round) 6.6 10	8.00E+02	0.00E+00	1.00E+02	8.00E+02
gymnodiniu gracilentum	4.90E+03	0.00E+00	6.00E+03	2.00E+02
gymnodiniu agiliforme	4.60E+03	8.00E+02	5.30E+03	2.00E+02
katodinium rotundatum	1.20E+03	5.52E+04	4.00E+02	8.00E+02
cryptomona spp. 5 10	2.62E+04	8.00E+04	1.82E+04	5.10E+04
cryptomona spp. 11-20	9.90E+03	1.76E+04	3.72E+04	3.40E+03
cryptomona spp. 21-30	8.00E+02	8.80E+03	7.00E+02	1.30E+03
isoselmis spp. hemiselmis 4 6	2.27E+05	7.56E+04	3.53E+05	3.92E+04
flagellate spp. 1-2	2.96E+05	1.56E+06	3.64E+05	1.97E+06
flagellate spp. 2-5	2.80E+04	1.65E+05	3.64E+05	3.53E+05
mesodinium rubrum	1.32E+04	4.50E+03	7.40E+03	5.00E+02

Cruise 89 02

Total Abundance (no. litre)

Taxon	3-2	3-3	4-2	4-3
synechococ spp.	3.19E+05	2.57E+05	3.19E+05	3.02E+05
anabaena spp.	0.00E+00	4.20E+03	0.00E+00	0.00E+00
solenicola setigera	6.10E+03	0.00E+00	3.40E+03	0.00E+00
ochromonas spp.	0.00E+00	0.00E+00	0.00E+00	1.08E+05
dinobryon sueoicum	2.00E+03	6.70E+03	9.00E+02	1.80E+04
meringosph mediterranea	0.00E+00	0.00E+00	2.00E+02	4.40E+03
imantonia rotundata	4.48E+04	3.08E+04	3.08E+05	7.00E+04
chrysochro sp.1	8.40E+03	1.54E+05	2.52E+04	3.11E+05
chrysochro spp. 4-5.5	1.40E+04	4.76E+04	1.40E+04	3.61E+05
chrysochro spp. 6-10	1.12E+04	0.00E+00	1.68E+04	4.00E+04
chrysochro spp. 15-20	0.00E+00	0.00E+00	0.00E+00	1.09E+04
phaeocysti pouchetii	2.70E+03	0.00E+00	2.86E+05	8.70E+04
leyanella arenaria	1.82E+05	0.00E+00	3.08E+05	0.00E+00
melosira moniliformis	0.00E+00	1.09E+04	0.00E+00	0.00E+00
leptocylin danicus	0.00E+00	0.00E+00	4.00E+02	0.00E+00
leptocylin minimus	0.00E+00	0.00E+00	0.00E+00	1.50E+03
leptocylin mediterraneu	1.80E+03	0.00E+00	8.00E+02	0.00E+00
skeletonem costatum	2.94E+05	4.00E+07	1.68E+06	1.05E+07
thalassios nordenskiold	0.00E+00	7.00E+02	2.00E+02	0.00E+00
thalassios pacifica	0.00E+00	5.00E+02	1.00E+03	0.00E+00
thalassios eccentrica	0.00E+00	0.00E+00	1.00E+02	0.00E+00
thalassios mendiolana	1.00E+02	0.00E+00	0.00E+00	0.00E+00
thalassios conferta	6.40E+03	0.00E+00	2.60E+03	1.71E+04
thalassios weisflogii	0.00E+00	8.48E+05	0.00E+00	0.00E+00
bidulphia aurita	0.00E+00	0.00E+00	2.00E+02	0.00E+00
chaetocero sp.g	1.00E+03	9.00E+02	7.00E+02	1.09E+04
chaetocero sp.h	0.00E+00	0.00E+00	1.30E+03	0.00E+00
chaetocero sp.l	0.00E+00	1.28E+05	0.00E+00	0.00E+00
chaetocero compressum	0.00E+00	0.00E+00	0.00E+00	8.20E+03
chaetocero constrictum	0.00E+00	0.00E+00	0.00E+00	3.00E+03
chaetocero convolutum	0.00E+00	0.00E+00	5.00E+02	0.00E+00
chaetocero debile	0.00E+00	0.00E+00	4.00E+02	2.80E+03
chaetocero decipiens	0.00E+00	0.00E+00	3.00E+02	1.10E+03
chaetocero diadema	0.00E+00	0.00E+00	0.00E+00	1.60E+03
chaetocero didymum	0.00E+00	0.00E+00	0.00E+00	1.30E+03

chaetocero laciniosum	0.00E+00	0.00E+00	0.00E+00	8.00E+02
chaetocero radicans	0.00E+00	0.00E+00	0.00E+00	1.36E+04
chaetocero socialis	0.00E+00	0.00E+00	7.00E+02	1.00E+03
rhizosolen fragilissima	0.00E+00	0.00E+00	5.00E+02	4.20E+03
rhizosolen fragilissima v.1	4.00E+02	0.00E+00	4.00E+02	0.00E+00
minuticell scriptus	7.80E+03	0.00E+00	5.60E+03	0.00E+00
synedra sp. 90-141x2-3	0.00E+00	8.00E+02	0.00E+00	0.00E+00
synedra spp. 95-110x6	0.00E+00	6.00E+02	0.00E+00	0.00E+00
thalassion nitzschoides	3.50E+04	5.36E+04	1.86E+04	6.90E+04
licmophora abbreviata	0.00E+00	3.00E+02	2.00E+02	8.00E+02
tabellaria sp. 36-59x3.3	0.00E+00	4.50E+03	0.00E+00	0.00E+00
nitzschia americana	2.00E+02	2.00E+02	3.00E+02	0.00E+00
nitzschia delicatissim	9.80E+03	1.00E+03	5.80E+03	8.10E+03
nitzschia longissima	9.00E+02	0.00E+00	2.00E+02	0.00E+00
nitzschia pungens	3.00E+02	0.00E+00	0.00E+00	0.00E+00
nitzschia bicapitata	2.70E+03	0.00E+00	3.40E+03	0.00E+00
nitzschia closterium	8.00E+02	8.00E+02	3.00E+02	0.00E+00
nitzschia closterium v.striatula	2.00E+02	0.00E+00	0.00E+00	3.00E+03
nitzschia cylindroform	2.28E+04	0.00E+00	1.67E+04	2.10E+03
nitzschia subcurvata	1.10E+03	0.00E+00	1.20E+03	3.50E+03
cylindroth fusiformis	2.00E+02	0.00E+00	0.00E+00	0.00E+00
pyramimona spp. 3-8	3.10E+03	0.00E+00	3.00E+02	8.00E+02
platymonas sp.	0.00E+00	0.00E+00	2.00E+02	0.00E+00
eutreptiel spp.	8.00E+02	0.00E+00	1.00E+02	5.00E+02
prorocentr sp. 14x11	0.00E+00	1.22E+04	0.00E+00	0.00E+00
gymnodiniu gracilentum	8.70E+03	0.00E+00	6.00E+03	1.90E+03
gymnodiniu agiliforme	3.20E+03	3.00E+02	1.60E+03	1.10E+03
katodinium rotundatum	9.00E+02	0.00E+00	2.10E+03	2.20E+03
cryptomona spp. 5-10	4.30E+04	2.96E+04	2.56E+04	2.54E+04
cryptomona spp. 11-20	1.32E+04	1.42E+04	1.42E+04	6.40E+03
cryptomona spp. 21-30	1.50E+03	0.00E+00	9.00E+02	0.00E+00
isoselmis spp. hemiselmis 4-6	2.39E+05	5.32E+04	3.95E+05	5.60E+04
flagellate spp. 1 2	3.88E+05	2.25E+06	3.25E+05	1.56E+06
flagellate spp. 2-5	1.96E+04	1.25E+05	8.55E+04	4.10E+05
flagellate spp. 6-15	3.00E+03	0.00E+00	0.00E+00	1.26E+04
flagellate sp. xiii	0.00E+00	9.12E+04	0.00E+00	0.00E+00
mesodinium rubrum	3.50E+03	1.00E+03	2.00E+02	4.30E+03

Cruise 89 02

Total Abundance (no./litre)

Taxon	5-2	5-3	6-2	6-3
synechococ spp.	3.99E+05	6.67E+05	3.65E+05	3.59E+05
dinobryon suecicum	1.00E+03	5.10E+04	7.00E+03	6.30E+04
dictyocha speculum	0.00E+00	8.00E+02	0.00E+00	0.00E+00
apedinella spinifera	0.00E+00	0.00E+00	2.00E+02	3.40E+03
pseudopedi pyriformis	0.00E+00	4.00E+02	0.00E+00	0.00E+00
meringosph mediterranea	2.00E+02	9.00E+02	4.00E+02	9.00E+02
imantonia rotundata	2.83E+07	2.07E+05	9.50E+06	5.78E+06
chrysochro sp.1	5.30E+03	1.57E+05	3.98E+05	3.88E+05
chrysochro spp. 4-5.5	5.00E+03	2.58E+05	1.54E+05	4.05E+05
chrysochro spp. 6-10	0.00E+00	3.80E+04	0.00E+00	0.00E+00
chrysochro spp. 15-20	0.00E+00	1.90E+04	1.00E+03	3.60E+04
phaeocysti pouchetii	4.98E+05	1.55E+05	1.95E+06	5.24E+05
schroedere delicatula	0.00E+00	0.00E+00	4.81E+04	1.81E+04
leptocylin danicus	0.00E+00	0.00E+00	7.20E+03	2.60E+04
leptocylin minimus	0.00E+00	9.00E+02	1.50E+04	9.00E+03
skeletonem costatum	5.58E+05	4.70E+06	2.53E+05	1.57E+06
thalassios aestivalis	0.00E+00	0.00E+00	0.00E+00	9.00E+02
thalassios nordenskiold	0.00E+00	0.00E+00	2.20E+03	0.00E+00
thalassios pacifica	1.00E+02	0.00E+00	1.82E+04	1.27E+04
thalassios eccentrica	2.00E+02	0.00E+00	0.00E+00	0.00E+00
thalassios mendiolana	0.00E+00	0.00E+00	5.00E+02	8.00E+02
thalassios conferta	4.00E+03	1.18E+04	0.00E+00	1.70E+03
eucampia zoodiacus	0.00E+00	0.00E+00	2.60E+03	5.00E+02
cerataulin pelagica	0.00E+00	0.00E+00	8.00E+02	2.00E+03
chaetocero sp.1	1.20E+03	1.10E+03	0.00E+00	0.00E+00
chaetocero sp.g	0.00E+00	6.80E+03	0.00E+00	0.00E+00
chaetocero compressum	3.00E+02	3.54E+04	2.28E+05	2.55E+05
chaetocero constrictum	0.00E+00	1.24E+04	1.18E+05	3.54E+05
chaetocero debile	3.40E+03	5.72E+04	9.70E+05	2.25E+06
chaetocero decipiens	0.00E+00	1.60E+03	1.45E+04	5.35E+04
chaetocero diadema	2.00E+02	1.90E+04	3.72E+04	6.80E+07
chaetocero didymum	0.00E+00	0.00E+00	6.30E+03	1.40E+04
chaetocero laciniosum	0.00E+00	1.70E+03	3.00E+04	4.64E+04
chaetocero radicans	0.00E+00	2.54E+04	5.90E+04	1.06E+06
chaetocero socialis	4.00E+02	7.20E+03	1.54E+05	6.40E+07

rhizosolen delicatula	0.00E+00	1.30E+03	0.00E+00	1.10E+03
rhizosolen fragilissima	0.00E+00	2.20E+03	1.20E+03	0.00E+00
rhizosolen fragilissima v.l	1.60E+03	9.00E+03	4.00E+02	1.60E+03
rhizosolen hebetata f.semispina	0.00E+00	0.00E+00	0.00E+00	9.10E+03
minuticell scriptus	1.12E+04	0.00E+00	0.00E+00	8.40E+03
thalassion nitzschoides	6.20E+03	2.54E+04	2.10E+03	9.00E+02
licmophora abbreviata	0.00E+00	0.00E+00	3.00E+02	0.00E+00
nitzschia americana	8.00E+02	0.00E+00	4.00E+02	1.90E+04
nitzschia delicatissim	7.30E+04	9.10E+03	8.80E+03	8.60E+03
nitzschia longissima	6.00E+02	0.00E+00	2.00E+02	1.30E+03
nitzschia turgiduloide	0.00E+00	0.00E+00	5.00E+02	1.00E+03
nitzschia bicapitata	1.30E+03	1.20E+03	0.00E+00	0.00E+00
nitzschia closterium	1.40E+03	7.00E+02	0.00E+00	1.31E+04
nitzschia closterium v.striatu a	0.00E+00	1.45E+04	1.52E+04	0.00E+00
nitzschia fraudulenta	0.00E+00	0.00E+00	0.00E+00	8.00E+02
nitzschia cylindroform	4.80E+03	3.54E+04	1.50E+03	9.50E+03
nitzschia subcurvata	2.22E+04	1.90E+04	2.20E+04	8.70E+04
cymbomonas spp.	0.00E+00	0.00E+00	3.00E+02	1.20E+03
bipedinomo spp.	0.00E+00	0.00E+00	1.40E+04	4.20E+04
pyramimona spp. 3-8	0.00E+00	1.40E+03	7.00E+02	3.20E+03
eutreptiel spp.	0.00E+00	3.00E+02	0.00E+00	0.00E+00
prorocentr minimum v.balticum	0.00E+00	0.00E+00	1.00E+02	5.00E+02
gonyaulax rugosum	0.00E+00	0.00E+00	0.00E+00	2.00E+02
gymnodiniu sp.5	0.00E+00	0.00E+00	5.00E+02	8.00E+02
gymnodiniu gracilentum	1.76E+04	9.00E+02	4.00E+02	5.00E+02
gymnodiniu agiliforme	0.00E+00	6.00E+02	0.00E+00	3.00E+02
gymnodiniu paulseni	0.00E+00	0.00E+00	0.00E+00	2.00E+02
katodinium rotundatum	6.00E+02	1.00E+03	0.00E+00	0.00E+00
cryptomona spp. 5-10	4.30E+04	2.90E+04	4.10E+04	1.00E+04
cryptomona spp. 11-20	1.44E+05	7.20E+03	3.50E+03	4.60E+03
cryptomona spp. 21-30	1.00E+03	0.00E+00	0.00E+00	1.30E+03
isoselmis spp. hemiselmis 4 8	1.63E+06	2.55E+05	1.01E+05	3.08E+04
flagellate spp. 1 2	2.87E+06	7.98E+05	8.78E+05	2.29E+06
flagellate spp. 2 5	4.10E+05	6.95E+05	1.14E+04	1.54E+05
flagellate spp. 6 15	1.20E+03	0.00E+00	0.00E+00	0.00E+00
mesodinium rubrum	1.78E+04	1.80E+03	0.00E+00	0.00E+00

Cruise 89 02

Total Abundance (no. litre)

Taxon	7-2	7-3	8-2	8-3
synechococ spp.	1.65E+05	3.93E+05	4.10E+05	6.21E+05
solenicola setigera	1.40E+04	0.00E+00	7.00E+04	0.00E+00
dinobryon suecicum	7.50E+03	6.20E+04	8.00E+03	3.20E+04
apedinella spinifera	1.20E+03	3.00E+02	2.30E+03	4.00E+02
pseudopedi pyriformis	1.60E+03	0.00E+00	9.00E+02	0.00E+00
olisthodis carterae	3.00E+02	0.00E+00	1.40E+03	1.20E+03
meringosph mediterranea	5.00E+02	1.00E+03	0.00E+00	2.00E+02
imantonia rotundata	1.04E+05	4.20E+04	2.83E+05	7.98E+05
chrysochro sp.1	2.80E+04	2.52E+04	0.00E+00	0.00E+00
chrysochro spp. 4 5.5	1.40E+04	4.40E+05	3.36E+04	5.04E+04
chrysochro spp. 15 20	1.20E+03	7.90E+04	1.40E+03	2.90E+04
phaeocysti pouchetii	0.00E+00	0.00E+00	2.73E+05	1.25E+05
stephanopy nipponica	0.00E+00	0.00E+00	4.60E+03	1.00E+03
schroedere delicatula	0.00E+00	8.00E+02	5.20E+03	1.68E+04
leptocylin danicus	8.00E+03	9.00E+03	1.62E+04	5.40E+03
leptocylin minimus	2.00E+03	2.40E+04	8.00E+02	1.09E+04
leptocylin mediterraneu	4.20E+03	0.00E+00	4.90E+03	0.00E+00
skeletonem costatum	8.37E+06	4.55E+05	5.37E+06	1.56E+06
thalassios gravida rotula	0.00E+00	0.00E+00	3.12E+04	0.00E+00
thalassios angulata	0.00E+00	0.00E+00	5.00E+02	0.00E+00
thalassios birata	0.00E+00	0.00E+00	6.00E+02	0.00E+00
thalassios aestivalis	0.00E+00	0.00E+00	1.60E+03	0.00E+00
thalassios nordenskiold	0.00E+00	0.00E+00	9.26E+04	2.40E+03
thalassios pacifica	1.00E+03	0.00E+00	1.50E+04	2.60E+03
thalassios eccentrica	0.00E+00	0.00E+00	4.60E+03	0.00E+00
thalassios mendiolana	1.38E+04	0.00E+00	8.62E+04	1.00E+03
thalassios conferta	4.00E+02	0.00E+00	2.10E+03	2.00E+02
eucampia spp.	1.10E+03	0.00E+00	0.00E+00	0.00E+00
eucampia zoodiacus	0.00E+00	0.00E+00	2.60E+03	1.30E+03
cerataulin pelagica	6.00E+02	8.00E+02	1.70E+03	2.20E+03
chaetocero sp.1	0.00E+00	1.20E+03	3.00E+02	0.00E+00
chaetocero sp.g	0.00E+00	0.00E+00	1.20E+03	4.00E+03
chaetocero compressum	6.53E+04	1.07E+05	1.05E+05	6.08E+05
chaetocero constrictum	1.88E+05	1.40E+05	5.31E+05	4.60E+05
chaetocero convolutum	1.40E+03	0.00E+00	8.00E+02	0.00E+00

chaetocero debile	9.35E+04	6.60E+05	8.08E+05	1.37E+06
chaetocero decipiens	2.27E+04	2.80E+03	1.81E+04	6.20E+03
chaetocero diadema	3.37E+05	1.05E+04	1.17E+06	4.19E+05
chaetocero didymum	2.40E+03	3.10E+03	4.10E+03	7.80E+03
chaetocero laciniosum	4.50E+03	3.80E+03	2.30E+03	3.60E+03
chaetocero radicans	1.05E+04	5.20E+03	1.36E+04	7.38E+04
chaetocero septentriona	0.00E+00	0.00E+00	9.00E+02	0.00E+00
chaetocero socialis	1.50E+05	1.62E+04	3.01E+06	2.64E+05
chaetocero teres	1.50E+03	8.00E+02	1.80E+03	0.00E+00
chaetocero vixvisibilis	0.00E+00	0.00E+00	0.00E+00	3.00E+02
bacteriast delicatula	0.00E+00	0.00E+00	0.00E+00	2.00E+02
rhizosolen alata f.alata	6.00E+02	0.00E+00	0.00E+00	1.00E+02
rhizosolen delicatula	0.00E+00	0.00E+00	0.00E+00	2.00E+02
rhizosolen fragilissima	8.00E+02	2.00E+02	6.00E+02	2.10E+03
rhizosolen fragilissima v.1	0.00E+00	4.90E+03	0.00E+00	2.00E+03
rhizosolen setigera	0.00E+00	0.00E+00	4.00E+02	0.00E+00
rhizosolen stolterfothi	0.00E+00	0.00E+00	1.10E+03	0.00E+00
ditylum brightwellii	0.00E+00	0.00E+00	1.20E+03	0.00E+00
minuticell scriptus	2.00E+02	0.00E+00	1.10E+03	3.50E+03
fragilaria spp.	0.00E+00	0.00E+00	2.60E+03	0.00E+00
asterionel glacialis	0.00E+00	4.00E+02	0.00E+00	0.00E+00
thalassiot longissima	3.40E+03	0.00E+00	0.00E+00	0.00E+00
thalassion nitzschoides	0.00E+00	2.00E+03	1.50E+03	1.20E+03
licmophora spp.	0.00E+00	0.00E+00	0.00E+00	4.00E+02
licmophora abbreviata	0.00E+00	2.00E+02	0.00E+00	0.00E+00
gyrosigma spp. pleurosigma	0.00E+00	0.00E+00	3.00E+02	0.00E+00
pleurosigm angulatum	0.00E+00	0.00E+00	3.00E+02	0.00E+00
pleurosigm acutum	0.00E+00	0.00E+00	1.00E+03	0.00E+00
nitzschia americana	4.40E+03	3.00E+03	1.39E+04	3.70E+03
nitzschia delicatissim	3.10E+03	3.20E+03	1.00E+04	1.72E+04
nitzschia longissima	7.00E+02	6.00E+02	1.10E+03	5.00E+02
nitzschia seriata	0.00E+00	0.00E+00	4.90E+03	0.00E+00
nitzschia turgiduloide	9.00E+02	2.00E+03	3.20E+03	4.30E+03
nitzschia bicapitata	0.00E+00	0.00E+00	0.00E+00	2.00E+02
nitzschia closterium	2.00E+02	0.00E+00	3.00E+02	1.00E+03
nitzschia closterium v.striatula	4.00E+02	3.30E+03	0.00E+00	1.00E+04
nitzschia fraudulenta	0.00E+00	0.00E+00	7.80E+03	0.00E+00
nitzschia cylindroform	2.20E+03	7.00E+02	6.60E+03	1.20E+03
nitzschia subcurvata	1.70E+03	1.20E+03	4.40E+03	5.50E+03
cylindroth fusiformis	0.00E+00	1.00E+02	3.00E+02	4.00E+02
cymbomonas spp.	0.00E+00	4.20E+03	0.00E+00	1.50E+03
nephroselm spp.	0.00E+00	0.00E+00	0.00E+00	8.00E+02
bipedinomo spp.	6.72E+04	5.32E+04	6.16E+04	1.12E+04
pyramimona spp. 3-8	2.00E+03	8.00E+02	3.50E+03	4.10E+03
platymonas sp.	4.00E+02	0.00E+00	0.00E+00	0.00E+00
pterosperm spp.	3.00E+02	0.00E+00	3.00E+02	5.00E+02
pterosperm cristatum	0.00E+00	3.00E+02	0.00E+00	0.00E+00
eutreptiel spp.	2.00E+02	0.00E+00	4.00E+02	6.00E+02
prorocentr minimum v.balticum	8.00E+02	9.00E+02	1.70E+03	4.00E+02

dinophysis spp.	0.00E+00	0.00E+00	0.00E+00	1.00E+02
gonyaulax rugosum	0.00E+00	2.40E+03	0.00E+00	1.00E+03
gonyaulax digitale	4.00E+02	0.00E+00	0.00E+00	0.00E+00
scripsiell spp. glenodinium 20 25	4.00E+02	7.00E+02	0.00E+00	0.00E+00
scripsiell spp. glenodinium 25 30	6.00E+02	0.00E+00	0.00E+00	0.00E+00
gymnodiniu sp.5	1.00E+02	0.00E+00	0.00E+00	3.40E+03
gymnodiniu simplex	0.00E+00	2.40E+03	0.00E+00	0.00E+00
gymnodiniu gracilentum	2.00E+02	2.00E+02	7.60E+03	9.00E+02
gymnodiniu agiliforme	2.00E+02	6.00E+02	6.00E+02	2.00E+02
gymnodiniu inequale	0.00E+00	0.00E+00	2.00E+02	0.00E+00
gymnodiniu paulseni	1.00E+03	0.00E+00	1.50E+03	0.00E+00
katodinium rotundatum	0.00E+00	0.00E+00	6.00E+02	1.30E+03
cryptomona spp. 5-10	6.00E+02	5.40E+03	1.50E+04	6.30E+03
cryptomona spp. 11-20	1.40E+03	1.80E+03	1.30E+04	1.01E+04
cryptomona spp. 21-30	5.00E+02	0.00E+00	6.00E+02	3.00E+02
isoselmis spp. hemiselmis 4 6	1.40E+04	3.08E+04	4.48E+04	1.04E+05
flagellate spp. 1-2	4.22E+05	9.23E+05	2.62E+05	1.51E+05
flagellate spp. 2 5	2.28E+04	5.13E+04	6.16E+05	2.74E+06
flagellate spp. 6 15	0.00E+00	0.00E+00	1.71E+04	0.00E+00
mesodinium rubrum	1.00E+03	2.00E+03	3.00E+02	2.20E+03

Cruise 89 02

Total Abundance (no. litre)

Taxon	9-2	9 3
synechococ spp.	5.08E+06	2.33E+06
dinobryon suecicum	1.30E+04	3.70E+04
dictyocha speculum	1.60E+03	9.00E+02
imantonia rotundata	4.30E+07	2.69E+07
chrysochro spp. 4-5.5	4.76E+04	3.92E+04
phaeocysti pouchetii	9.89E+06	7.87E+06
leyanella arenaria	1.48E+05	2.28E+05
stephanopy nipponica	4.40E+03	1.20E+03
schroedere delicatula	1.00E+03	3.60E+03
leptocylin danicus	1.40E+03	5.00E+03
skeletonem costatum	1.70E+06	3.11E+06
thalassios rotula	2.20E+03	1.00E+03
thalassios anguste-line	0.00E+00	4.00E+02
thalassios nordenskiold	6.00E+02	1.80E+03
thalassios pacifica	1.72E+04	7.20E+03
thalassios mendiolana	3.00E+02	2.60E+03
thalassios conferta	1.58E+04	5.40E+03
eucampia zoodiacus	2.90E+03	7.00E+02
cerataulin pelagica	0.00E+00	8.00E+02
chaetocero sp.g	0.00E+00	6.00E+02
chaetocero compressum	3.60E+03	8.10E+03
chaetocero constrictum	5.63E+04	6.26E+04
chaetocero convolutum	9.00E+02	5.00E+02
chaetocero debile	7.76E+05	6.08E+05
chaetocero decipiens	4.50E+03	4.00E+02
chaetocero diadema	5.63E+04	6.80E+03
chaetocero laciniosum	0.00E+00	5.30E+03
chaetocero radicans	1.45E+04	1.54E+04
chaetocero septentriona	2.00E+02	8.00E+02
chaetocero socialis	1.04E+05	8.85E+04
rhizosolen fragilissima	7.45E+04	5.08E+04
rhizosolen fragilissima v.1	4.00E+02	7.00E+02
minuticell scriptus	7.50E+04	6.70E+04
thalassion nitzschoides	3.40E+03	7.50E+03
thalassion bacillaris	0.00E+00	4.00E+02

gyrosigma spp. pleurosigma	0.00E+00	3.00E+02
nitzschia americana	1.10E+03	6.30E+03
nitzschia delicatissim	1.10E+05	1.50E+05
nitzschia longissima	0.00E+00	1.10E+03
nitzschia bicapitata	5.60E+03	0.00E+00
nitzschia closterium	2.00E+02	7.00E+02
nitzschia cylindroform	3.50E+04	5.20E+04
nitzschia subcurvata	8.40E+04	4.50E+04
cylindroth fusiformis	0.00E+00	2.00E+02
pyramimona spp. 3 8	2.90E+03	7.00E+02
eutreptiel spp.	0.00E+00	5.00E+02
gymnodiniu gracilentum	7.90E+03	2.00E+03
gymnodiniu agiliforme	2.80E+03	6.00E+02
gymnodiniu paulseni	1.20E+03	4.00E+02
katodinium rotundatum	2.74E+04	1.63E+04
cryptomona spp. 5-10	1.87E+05	6.70E+04
cryptomona spp. 11-20	5.30E+04	9.20E+04
cryptomona spp. 21-30	4.00E+02	1.10E+03
isoselmis spp. hemiselmis 4-6	1.28E+06	2.25E+06
flagellate spp. 1-2	4.14E+06	1.84E+06
flagellate spp. 2-5	1.03E+05	5.70E+04
mesodinium rubrum	5.60E+03	5.20E+03

TABLE 10 OE8904 PHYTOPLANKTON IDENTITY AND ABUNDANCE

Cruise 89 04

Total Abundance (no./litre)

Taxon	1-2	1-3	2-2	2-3
synechococ spp.	6.00E+04	0.00E+00	1.64E+07	1.06E+05
dinobryon suecicum	6.00E+02	3.00E+02	1.70E+04	0.00E+00
dictyocha speculum	0.00E+00	2.00E+02	0.00E+00	2.00E+02
pseudopedi pyriformis	0.00E+00	0.00E+00	9.00E+02	0.00E+00
chrysochro sp.1	1.68E+04	1.68E+04	1.61E+06	1.12E+04
chrysochro spp. 4-5.5	5.04E+04	1.40E+04	7.17E+06	3.92E+04
chrysochro spp. 6-10	0.00E+00	0.00E+00	3.08E+05	1.40E+04
chrysochro spp. 15-20	0.00E+00	0.00E+00	2.00E+02	0.00E+00
leptocylin danicus	0.00E+00	0.00E+00	9.00E+02	3.20E+03
leptocylin minimus	0.00E+00	0.00E+00	1.47E+04	0.00E+00
leptocylin mediterraneu	0.00E+00	0.00E+00	3.00E+02	0.00E+00
skeletonem costatum	0.00E+00	0.00E+00	2.20E+03	2.80E+03
thalassios rotula	0.00E+00	0.00E+00	0.00E+00	2.20E+03
thalassios aestivalis	0.00E+00	0.00E+00	0.00E+00	6.00E+02
thalassios nordenskiold	0.00E+00	1.00E+02	0.00E+00	2.00E+02
thalassios mendiolana	3.00E+02	0.00E+00	0.00E+00	2.00E+02
thalassios conferta	0.00E+00	0.00E+00	3.60E+03	0.00E+00
coscinodis spp.	0.00E+00	0.00E+00	0.00E+00	1.00E+02
cerataulin pelagica	0.00E+00	0.00E+00	4.00E+02	0.00E+00
chaetocero sp.1 (=D)	0.00E+00	0.00E+00	1.50E+03	0.00E+00
chaetocero sp.k	0.00E+00	0.00E+00	1.21E+05	0.00E+00
chaetocero sp.l	0.00E+00	0.00E+00	2.10E+03	0.00E+00
chaetocero cf.affine v.circinalis	0.00E+00	0.00E+00	6.40E+03	5.00E+02
chaetocero cf.perpusill	0.00E+00	0.00E+00	1.80E+03	0.00E+00
chaetocero affine	0.00E+00	0.00E+00	0.00E+00	2.00E+02
chaetocero breve	0.00E+00	0.00E+00	1.20E+03	1.00E+03
chaetocero compressum	0.00E+00	0.00E+00	4.52E+04	1.64E+05
chaetocero convolutum	0.00E+00	0.00E+00	4.00E+02	4.80E+03
chaetocero danicum	0.00E+00	0.00E+00	7.00E+02	0.00E+00
chaetocero debile	0.00E+00	0.00E+00	5.00E+02	5.20E+03
chaetocero decipiens	0.00E+00	0.00E+00	0.00E+00	4.00E+02
chaetocero diadema	0.00E+00	0.00E+00	0.00E+00	1.00E+03
chaetocero didymum	0.00E+00	0.00E+00	2.80E+03	6.20E+03
chaetocero laciniosum	0.00E+00	0.00E+00	6.00E+02	0.00E+00
chaetocero pseudocrinit	0.00E+00	0.00E+00	4.00E+03	4.00E+02

chaetocero radicans	0 00E+00	0.00E+00	4.50E+03	3.14E+04
chaetocero vixvisibilis	0.00E+00	0.00E+00	4.00E+02	0.00E+00
bacteriast delicatula	0.00E+00	0.00E+00	2.18E+04	1.60E+04
rhizosolen delicatula	0.00E+00	0.00E+00	7.00E+02	1.60E+03
rhizosolen fragilissima	0.00E+00	0.00E+00	1.70E+03	8.00E+02
rhizosolen hebetata f.semispina	0.00E+00	0.00E+00	0.00E+00	2.00E+02
rhizosolen stolterfothi	0.00E+00	0.00E+00	0.00E+00	1.40E+03
minuticell scriptus	0.00E+00	0.00E+00	0.00E+00	3.30E+03
synedra spp. 95 110x6	0.00E+00	0.00E+00	1.00E+02	0.00E+00
thalassion nitzschoides	8.00E+02	7.00E+02	1.21E+04	1.80E+03
licmophora spp.	0.00E+00	0.00E+00	4.00E+02	4.00E+02
nitzschia americana	0.00E+00	0.00E+00	5.00E+02	4.30E+03
nitzschia delicatissim	7.00E+02	3.00E+02	2.00E+03	8.10E+03
nitzschia closterium	0.00E+00	0.00E+00	6.00E+02	2.20E+03
nitzschia cylindroform	8.00E+02	1.20E+03	0.00E+00	0.00E+00
nitzschia impressa	0.00E+00	0.00E+00	0.00E+00	1.20E+03
bipedinomo spp.	0.00E+00	0.00E+00	1.12E+04	0.00E+00
pyramimona spp. 3 8	9.00E+02	1.60E+03	1.19E+05	0.00E+00
platymonas sp.	0.00E+00	0.00E+00	2.32E+04	1.26E+04
pterosperm spp. 0 5	0.00E+00	0.00E+00	2.80E+03	0.00E+00
pterosperm spp. 5 7	0.00E+00	0.00E+00	7.00E+03	0.00E+00
pterosperm spp. >7	3.70E+03	3.60E+03	4.20E+03	3.30E+03
dinophysis acuminata	0.00E+00	0.00E+00	3.00E+02	0.00E+00
scripsiell spp. glenodinium 15-20	0.00E+00	2.00E+02	0.00E+00	0.00E+00
scripsiell spp. glenodinium 20-25	0.00E+00	1.00E+02	2.00E+02	0.00E+00
scripsiell spp. glenodinium 25 30	0.00E+00	0.00E+00	4.00E+02	0.00E+00
glenodiniu inequale	0.00E+00	0.00E+00	1.43E+04	0.00E+00
gymnodiniu gracilentum	1.00E+03	3.00E+02	3.60E+03	0.00E+00
gymnodiniu agiliforme	0.00E+00	0.00E+00	1.20E+03	4.00E+02
gymnodiniu paulseni	5.00E+02	0.00E+00	5.00E+02	0.00E+00
heterocaps triquetra	0.00E+00	0.00E+00	5.00E+02	0.00E+00
cryptomona spp. 5-10	5.76E+05	7.06E+05	1.62E+04	6.30E+04
cryptomona spp. 10.1-15	1.12E+04	5.00E+03	2.04E+04	4.60E+03
cryptomona spp. 21-30	5.80E+03	1.50E+03	2.40E+04	0.00E+00
isoselmis spp. hemiselmis 4 6	1.12E+04	6.10E+03	8.40E+03	1.12E+04
flagellate spp. 1-2	1.64E+06	7.87E+05	2.99E+06	6.16E+05
flagellate spp. 2-5	3.36E+04	1.03E+05	1.20E+05	5.88E+04
flagellate spp. 6-15	0.00E+00	0.00E+00	3.42E+04	0.00E+00
mesodinium rubrum	3.00E+02	9.00E+02	1.68E+04	3.00E+02

Cruise 89 04

Total Abundance (no. litre)

Taxon	3-2	3-3	4-2	4-3
synechococ spp.	2.28E+04	1.86E+06	9.75E+05	2.00E+05
dinobryon suecicum	2.40E+04	2.04E+05	0.00E+00	1.50E+04
apedinella spinifera	0.00E+00	9.00E+02	1.28E+04	1.50E+03
olisthodis carterae	0.00E+00	0.00E+00	1.10E+03	0.00E+00
chrysochro sp.1	1.40E+04	2.02E+06	1.40E+04	1.21E+06
chrysochro spp. 4-5.5	4.48E+04	6.21E+05	8.96E+04	9.01E+05
chrysochro spp. 6 10	3.08E+04	1.00E+05	3.92E+04	2.05E+05
chrysochro spp. 15-20	0.00E+00	6.80E+03	4.10E+03	1.22E+04
schroedere delicatula	0.00E+00	2.30E+03	2.20E+03	0.00E+00
leptocylin danicus	1.33E+04	0.00E+00	2.70E+03	5.90E+03
leptocylin minimus	2.70E+05	6.13E+04	1.18E+04	5.10E+04
leptocylin mediterraneu	0.00E+00	1.80E+03	0.00E+00	0.00E+00
skeletonem costatum	1.50E+03	1.81E+04	1.58E+04	5.70E+03
thalassios rotula	1.80E+03	0.00E+00	1.58E+04	0.00E+00
thalassios aestivalis	2.00E+02	0.00E+00	1.31E+04	0.00E+00
thalassios nordenskiold	2.00E+03	0.00E+00	6.60E+03	0.00E+00
thalassios pacifica	0.00E+00	0.00E+00	5.00E+02	0.00E+00
thalassios eccentrica	1.00E+02	0.00E+00	7.00E+02	0.00E+00
thalassios mendiolana	1.90E+03	0.00E+00	2.30E+03	0.00E+00
thalassios conferta	1.20E+03	0.00E+00	2.70E+03	0.00E+00
coscinodis spp.	5.00E+02	0.00E+00	2.00E+02	0.00E+00
chaetocero sp.k	3.80E+03	7.63E+05	3.40E+03	7.00E+04
chaetocero cf.affine v.circinalis	0.00E+00	2.72E+04	0.00E+00	1.60E+03
chaetocero breve	3.50E+03	0.00E+00	6.80E+03	0.00E+00
chaetocero compressum	6.97E+05	3.58E+06	9.35E+05	7.32E+05
chaetocero constrictum	1.20E+03	0.00E+00	2.40E+04	0.00E+00
chaetocero convolutum	5.20E+03	2.30E+03	0.00E+00	0.00E+00
chaetocero debile	1.27E+04	7.70E+03	1.07E+05	6.40E+03
chaetocero decipiens	0.00E+00	1.13E+04	0.00E+00	0.00E+00
chaetocero diadema	8.20E+03	3.20E+03	1.22E+04	1.60E+03
chaetocero didymum	5.40E+03	7.30E+03	0.00E+00	1.30E+03
chaetocero laciniosum	1.00E+03	9.90E+03	4.00E+03	0.00E+00
chaetocero pseudocrinit	1.48E+04	2.95E+04	1.24E+05	1.32E+04
chaetocero radicans	1.92E+05	5.54E+05	9.70E+04	8.30E+03
chaetocero socialis	4.17E+04	2.27E+04	2.50E+04	2.40E+03

bacteriast delicatula	6.17E+04	2.77E+05	2.63E+04	3.56E+05
rhizosolen alata f.gracillima	0.00E+00	0.00E+00	6.00E+02	0.00E+00
rhizosolen delicatula	1.90E+03	5.90E+03	3.90E+03	8.00E+02
rhizosolen fragilissima	0.00E+00	4.00E+02	0.00E+00	6.00E+02
rhizosolen fragilissima v.l	0.00E+00	1.80E+03	0.00E+00	0.00E+00
rhizosolen stolterfothi	2.60E+03	9.00E+02	3.10E+03	2.00E+02
minuticell scriptus	0.00E+00	1.80E+03	6.30E+03	2.50E+03
thalassion nitzschoides	8.00E+02	2.30E+03	7.00E+02	4.00E+02
nitzschia americana	3.60E+04	3.20E+03	2.10E+04	2.60E+03
nitzschia delicatissim	8.80E+03	6.30E+03	2.22E+04	8.50E+03
nitzschia pungens	5.00E+02	0.00E+00	1.70E+03	0.00E+00
nitzschia seriata	3.00E+02	0.00E+00	1.00E+03	0.00E+00
nitzschia seriata v.obtusa	6.20E+03	0.00E+00	8.00E+02	3.00E+02
nitzschia lineola	0.00E+00	0.00E+00	0.00E+00	2.00E+02
nitzschia closterium	7.00E+03	2.70E+03	4.10E+03	1.60E+03
nitzschia closterium v.striatula	0.00E+00	0.00E+00	0.00E+00	3.00E+02
nitzschia subfraudulen	2.10E+03	9.00E+02	0.00E+00	0.00E+00
cylindroth fusiformis	7.00E+02	0.00E+00	1.40E+03	4.00E+02
nephroselm spp.	2.80E+04	6.36E+04	5.60E+03	3.92E+04
pyramimona spp. 3 8	2.70E+04	4.00E+04	5.80E+04	4.40E+03
platymonas sp.	0.00E+00	2.70E+03	1.45E+04	2.10E+03
pterosperm spp.	0.00E+00	0.00E+00	1.20E+03	0.00E+00
pterosperm spp. 0 5	0.00E+00	2.30E+03	0.00E+00	1.02E+04
pterosperm spp. 5 7	0.00E+00	5.90E+03	0.00E+00	1.80E+03
pterosperm spp. >7	1.44E+04	4.35E+04	0.00E+00	6.70E+03
prorocentr minimum v.balticum	9.00E+02	1.80E+03	1.70E+03	3.30E+03
prorocentr rotundatum	0.00E+00	0.00E+00	0.00E+00	5.00E+02
dinophysis ovum	0.00E+00	0.00E+00	1.20E+03	2.00E+02
gonyaulax digitale	1.00E+02	0.00E+00	0.00E+00	0.00E+00
scripsiell spp. glenodinium 20-25	8.00E+02	1.40E+03	6.00E+02	2.00E+02
scripsiell spp. glenodinium 25 30	0.00E+00	0.00E+00	0.00E+00	7.00E+02
scripsiell trochoidea	2.00E+02	9.00E+02	1.00E+03	4.00E+02
gymnodiniu flavum	0.00E+00	4.00E+02	2.00E+02	1.10E+03
gymnodiniu gracilentum	7.20E+03	4.50E+03	1.18E+04	9.00E+03
gymnodiniu agiliforme	2.00E+03	4.10E+03	2.20E+03	1.20E+03
gymnodiniu paulseni	4.00E+02	7.70E+03	3.90E+03	4.50E+03
heterocaps triquetra	0.00E+00	1.40E+03	0.00E+00	0.00E+00
ceratium lineatum	0.00E+00	0.00E+00	5.00E+02	0.00E+00
cryptomona spp. 5-10	1.50E+04	4.45E+04	2.76E+04	2.30E+04
cryptomona spp. 10.1-15	5.20E+03	9.10E+03	1.18E+04	6.80E+03
cryptomona spp. 21-30	4.20E+03	9.10E+03	2.50E+03	0.00E+00
isoselmis spp. hemiselmis 4 6	1.96E+04	1.27E+04	1.68E+04	0.00E+00
flagellate spp. 1-2	5.47E+05	2.41E+06	5.02E+05	1.43E+06
flagellate spp. 2-5	5.04E+04	4.70E+05	1.94E+05	3.65E+05
flagellate spp. 6-15	0.00E+00	0.00E+00	0.00E+00	3.00E+03
mesodinium rubrum	1.00E+03	0.00E+00	6.00E+02	4.00E+02

Cruise 89 04

Total Abundance (no./litre)

Taxon	5-2	5-3	6-2	6-3
synechococ spp.	0.00E+00	8.19E+05	2.28E+04	4.10E+05
dinobryon suecicum	4.10E+04	2.05E+04	4.90E+04	2.30E+04
apedinella spinifera	1.84E+05	2.40E+03	0.00E+00	0.00E+00
pseudopedi pyriformis	0.00E+00	0.00E+00	1.20E+03	0.00E+00
olisthodis carterae	1.59E+05	4.90E+03	1.74E+04	0.00E+00
chrysochro sp.1	1.40E+04	1.71E+05	3.08E+04	2.69E+05
chrysochro spp. 4-5.5	7.56E+04	8.09E+05	7.84E+04	1.15E+05
chrysochro spp. 6-10	1.68E+04	1.94E+05	2.80E+04	2.24E+04
chrysochro spp. 15 20	3.80E+03	4.46E+04	1.12E+04	2.10E+03
leptocylin danicus	5.70E+03	6.80E+03	0.00E+00	1.10E+03
leptocylin minimus	2.70E+03	1.35E+05	1.39E+04	4.64E+04
leptocylin mediterraneu	0.00E+00	0.00E+00	0.00E+00	4.00E+02
skeletonem costatum	1.32E+04	0.00E+00	4.20E+03	1.05E+04
thalassios rotula	2.60E+03	0.00E+00	0.00E+00	0.00E+00
thalassios nordenskiold	1.50E+03	0.00E+00	3.00E+02	0.00E+00
thalassios mendiolana	8.00E+02	0.00E+00	0.00E+00	0.00E+00
thalassios conferta	1.40E+03	0.00E+00	0.00E+00	0.00E+00
eucampia zoodiacus	0.00E+00	0.00E+00	2.00E+02	0.00E+00
chaetocero sp.1 (-D)	8.40E+03	9.00E+03	0.00E+00	0.00E+00
chaetocero sp.a	0.00E+00	0.00E+00	1.20E+03	0.00E+00
chaetocero sp.h	1.50E+04	5.60E+04	1.60E+03	6.20E+03
chaetocero sp.j	0.00E+00	0.00E+00	0.00E+00	1.46E+05
chaetocero cf.affine v.circinalis	0.00E+00	6.00E+02	0.00E+00	7.00E+02
chaetocero compressum	6.14E+04	4.55E+05	0.00E+00	3.30E+03
chaetocero convolutum	0.00E+00	4.00E+02	0.00E+00	0.00E+00
chaetocero danicum	0.00E+00	1.00E+03	0.00E+00	0.00E+00
chaetocero debile	2.10E+04	3.10E+03	0.00E+00	7.00E+02
chaetocero diadema	1.33E+04	4.30E+03	0.00E+00	0.00E+00
chaetocero didymum	6.80E+03	3.00E+03	0.00E+00	0.00E+00
chaetocero pseudocrinit	2.70E+03	3.20E+03	0.00E+00	0.00E+00
chaetocero radicans	3.50E+03	0.00E+00	0.00E+00	0.00E+00
chaetocero septentriona	1.80E+03	0.00E+00	6.00E+02	0.00E+00
chaetocero socialis	9.50E+03	1.80E+03	1.00E+03	0.00E+00
chaetocero vixvisibilis	0.00E+00	0.00E+00	0.00E+00	4.00E+02
bacteriast delicatula	4.70E+03	1.32E+05	0.00E+00	7.50E+03

rhizosolen alata f.gracillima	0.00E+00	1.00E+03	0.00E+00	0.00E+00
rhizosolen delicatula	1.00E+03	3.50E+03	0.00E+00	5.00E+02
rhizosolen fragilissima	0.00E+00	6.00E+02	0.00E+00	4.00E+02
rhizosolen fragilissima v.1	0.00E+00	0.00E+00	0.00E+00	7.00E+02
thalassion nitzschoides	0.00E+00	1.50E+03	0.00E+00	0.00E+00
nitzschia americana	1.00E+03	0.00E+00	0.00E+00	0.00E+00
nitzschia delicatissim	1.50E+03	0.00E+00	0.00E+00	0.00E+00
nitzschia closterium	5.60E+03	3.80E+03	2.00E+03	1.05E+04
nitzschia closterium v.striatula	0.00E+00	0.00E+00	0.00E+00	1.10E+03
nitzschia subcurvata	0.00E+00	0.00E+00	0.00E+00	2.60E+03
cylindroth fusiformis	3.00E+02	1.00E+03	3.00E+02	4.00E+02
nephroselm spp.	1.12E+04	5.70E+03	0.00E+00	0.00E+00
bipedinomo spp.	0.00E+00	0.00E+00	0.00E+00	1.14E+04
pyramimona spp. 3 8	7.20E+04	1.03E+05	2.10E+03	3.14E+05
platymonas sp.	0.00E+00	4.00E+02	0.00E+00	5.00E+02
pterosperm spp. 0-5	1.34E+05	0.00E+00	0.00E+00	0.00E+00
pterosperm spp. -7	8.60E+04	3.10E+04	5.60E+04	2.12E+04
eutreptiel spp.	0.00E+00	2.20E+03	0.00E+00	1.64E+04
prorocentr minimum v.balticum	3.10E+03	3.40E+03	1.30E+03	0.00E+00
dinophysis ovum	0.00E+00	0.00E+00	1.00E+02	0.00E+00
scripsiell sp.2 (-114)	0.00E+00	0.00E+00	0.00E+00	4.00E+02
scripsiell trochoidea	0.00E+00	4.00E+02	0.00E+00	0.00E+00
gymnodiniu flavum	0.00E+00	0.00E+00	2.00E+02	0.00E+00
gymnodiniu gracilentum	5.80E+03	2.00E+03	2.40E+03	1.60E+03
gymnodiniu agiliforme	6.00E+02	0.00E+00	2.90E+03	0.00E+00
gymnodiniu paulseni	2.80E+03	1.10E+03	0.00E+00	0.00E+00
cryptomona spp. 5-10	2.76E+04	4.30E+04	5.90E+03	4.90E+04
cryptomona spp. 10.1 15	6.00E+03	3.20E+03	6.00E+02	2.50E+03
isoselmis spp. hemiselmis 4 6	0.00E+00	0.00E+00	0.00E+00	1.80E+04
flagellate spp.	0.00E+00	1.64E+06	0.00E+00	0.00E+00
flagellate spp. 1 2	1.65E+05	6.96E+05	4.79E+05	1.22E+06
flagellate spp. 2 5	7.41E+04	0.00E+00	4.56E+04	3.19E+05
mesodinium rubrum	0.00E+00	0.00E+00	3.00E+02	3.00E+02

Cruise 89 04

Total Abundance (no./litre)

Taxon	7-2	7-3	8-2	8-3
synechococ spp.	0.00E+00	0.00E+00	0.00E+00	1.14E+04
solenicola setigera	4.60E+03	0.00E+00	0.00E+00	0.00E+00
dinobryon suecicum	5.00E+03	2.04E+04	1.09E+05	2.20E+03
apedinella spinifera	0.00E+00	2.30E+03	0.00E+00	1.50E+03
pseudopedi pyriformis	0.00E+00	0.00E+00	4.10E+03	0.00E+00
olisthodis carterae	0.00E+00	4.10E+03	0.00E+00	1.50E+03
chrysochro sp.1	0.00E+00	1.23E+05	1.18E+05	1.42E+05
chrysochro spp. 4-5.5	3.40E+04	1.77E+05	2.72E+04	3.88E+05
chrysochro spp. 6-10	5.00E+03	2.95E+04	0.00E+00	2.85E+04
chrysochro spp. 15-20	0.00E+00	3.04E+04	0.00E+00	1.90E+04
stephanopy nipponica	0.00E+00	0.00E+00	5.40E+03	0.00E+00
schroedere delicatula	5.60E+03	1.59E+04	1.04E+04	0.00E+00
leptocylin danicus	1.15E+04	1.45E+04	1.41E+04	9.00E+03
leptocylin minimus	8.70E+03	1.02E+05	3.20E+03	2.01E+05
leptocylin mediterraneu	6.00E+02	0.00E+00	0.00E+00	0.00E+00
skeletonem costatum	1.81E+05	6.49E+04	0.00E+00	0.00E+00
thalassios spp.	6.00E+02	0.00E+00	0.00E+00	0.00E+00
thalassios rotula	2.10E+03	2.30E+03	7.30E+03	0.00E+00
thalassios anguste line	3.00E+02	0.00E+00	0.00E+00	0.00E+00
thalassios aestivalis	3.20E+03	8.20E+03	1.45E+04	0.00E+00
thalassios nordenskiold	1.88E+04	7.70E+03	2.54E+04	0.00E+00
thalassios pacifica	4.30E+03	2.70E+03	1.80E+03	0.00E+00
thalassios eccentrica	8.00E+02	0.00E+00	0.00E+00	0.00E+00
thalassios mendiolana	2.40E+03	9.00E+02	1.63E+04	0.00E+00
thalassios conferta	4.30E+03	3.20E+03	3.60E+03	0.00E+00
cerataulin pelagica	4.00E+02	4.00E+02	0.00E+00	0.00E+00
chaetocero sp.1 (-D)	0.00E+00	1.40E+03	0.00E+00	0.00E+00
chaetocero sp.h	1.20E+03	1.40E+05	2.95E+04	4.56E+04
chaetocero cf.affine v.circinalis	0.00E+00	1.80E+03	0.00E+00	6.00E+02
chaetocero cf.perpusill	0.00E+00	0.00E+00	6.80E+03	0.00E+00
chaetocero breve	4.90E+03	1.22E+04	0.00E+00	1.60E+03
chaetocero compressum	4.20E+05	5.38E+06	4.10E+06	4.55E+05
chaetocero constrictum	3.50E+03	0.00E+00	3.58E+04	0.00E+00
chaetocero convolutum	6.80E+03	0.00E+00	3.45E+04	0.00E+00
chaetocero curvisetum	0.00E+00	3.20E+03	0.00E+00	0.00E+00

chaetocero danicum	7.00E+02	0.00E+00	9.00E+02	0.00E+00
chaetocero debile	2.11E+05	4.00E+05	5.63E+04	0.00E+00
chaetocero diadema	3.60E+03	0.00E+00	4.36E+04	2.60E+05
chaetocero didymum	5.30E+03	2.04E+04	1.91E+05	0.00E+00
chaetocero lorenzianum	7.00E+02	0.00E+00	0.00E+00	0.00E+00
chaetocero pseudocrinit	5.00E+03	6.53E+04	2.72E+04	4.80E+05
chaetocero radicans	1.18E+05	1.84E+05	6.86E+05	0.00E+00
chaetocero septentriona	4.30E+03	0.00E+00	1.04E+04	0.00E+00
chaetocero socialis	2.02E+05	1.36E+04	4.52E+05	5.00E+03
chaetocero vixvisibilis	2.20E+03	9.00E+02	1.80E+03	0.00E+00
bacteriast delicatula	1.50E+03	2.54E+05	2.95E+04	2.18E+05
rhizosolen alata f.gracillima	3.00E+02	0.00E+00	0.00E+00	3.00E+02
rhizosolen delicatula	1.20E+03	1.00E+04	2.20E+03	4.50E+03
rhizosolen fragilissima	1.50E+03	2.30E+03	4.00E+02	0.00E+00
rhizosolen fragilissima v.1	1.50E+03	0.00E+00	1.80E+03	1.00E+03
rhizosolen stolterfothi	8.00E+02	0.00E+00	5.90E+03	0.00E+00
ditylum brightwellii	2.00E+02	0.00E+00	0.00E+00	0.00E+00
minuticell scriptus	7.00E+03	0.00E+00	3.60E+03	0.00E+00
thalassion nitzschoides	2.80E+03	9.00E+02	5.40E+03	1.10E+03
gyrosigma spp. pleurosigma	7.00E+02	0.00E+00	9.00E+02	0.00E+00
nitzschia americana	9.20E+04	2.81E+04	2.79E+05	4.00E+03
nitzschia delicatissim	2.92E+05	5.22E+04	7.58E+04	3.10E+03
nitzschia pungens	4.20E+03	0.00E+00	1.40E+03	0.00E+00
nitzschia seriata	3.00E+02	0.00E+00	0.00E+00	0.00E+00
nitzschia seriata v.obtusa	2.40E+03	4.10E+03	9.00E+02	0.00E+00
nitzschia lineola	0.00E+00	9.00E+02	0.00E+00	0.00E+00
nitzschia closterium	1.00E+04	1.91E+04	1.68E+04	5.20E+03
nitzschia closterium v.striatula	0.00E+00	2.49E+04	0.00E+00	0.00E+00
nitzschia subfraudulen	2.50E+03	0.00E+00	5.40E+03	0.00E+00
nitzschia cylindroform	9.20E+04	4.50E+03	2.70E+03	0.00E+00
nitzschia impressa	7.10E+03	0.00E+00	1.80E+03	0.00E+00
nitzschia subcurvata	6.60E+03	1.40E+03	0.00E+00	5.00E+02
cylindroth fusiformis	6.00E+02	0.00E+00	1.40E+03	3.00E+02
cymbomonas spp.	0.00E+00	0.00E+00	0.00E+00	1.20E+04
nephroselm spp.	0.00E+00	0.00E+00	0.00E+00	4.56E+04
bipedinomo spp.	0.00E+00	0.00E+00	2.30E+03	0.00E+00
pyramimona spp. 3 8	2.40E+03	1.91E+04	1.27E+04	6.20E+03
platymonas sp.	0.00E+00	1.80E+03	0.00E+00	1.00E+03
pterosperm spp. 0 5	0.00E+00	1.36E+04	0.00E+00	0.00E+00
pterosperm spp. 5 7	0.00E+00	5.40E+03	0.00E+00	0.00E+00
pterosperm spp. >7	0.00E+00	0.00E+00	1.40E+03	0.00E+00
eutreptiel spp.	0.00E+00	0.00E+00	0.00E+00	4.00E+02
prorocentr spp.	6.00E+02	0.00E+00	0.00E+00	0.00E+00
prorocentr minimum v.balticum	0.00E+00	0.00E+00	0.00E+00	2.50E+03
prorocentr balticum	0.00E+00	2.30E+03	0.00E+00	0.00E+00
prorocentr rotundatum	0.00E+00	0.00E+00	0.00E+00	3.00E+02
dinophysis acuminata	0.00E+00	0.00E+00	9.00E+02	0.00E+00
dinophysis ovum	0.00E+00	0.00E+00	4.00E+02	0.00E+00
gonyaulax diagensis	2.00E+02	0.00E+00	0.00E+00	0.00E+00

scripsiell spp. glenodinium 15 20	0.00E+00	0.00E+00	0.00E+00	3.00E+02
scripsiell trochoidea	0.00E+00	0.00E+00	0.00E+00	6.00E+02
gymnodiniu gracilentum	1.00E+03	3.60E+03	3.60E+03	1.00E+03
gymnodiniu agiliforme	9.00E+02	4.00E+02	4.00E+02	0.00E+00
gymnodiniu paulseni	2.50E+03	0.00E+00	1.82E+04	4.00E+02
heterocaps triquetra	0.00E+00	0.00E+00	0.00E+00	4.00E+02
cryptomona spp. 5-10	2.82E+04	1.36E+04	6.13E+04	2.08E+04
cryptomona spp. 10.1-15	1.10E+03	8.60E+03	1.77E+04	1.44E+04
cryptomona spp. 15.1-20	0.00E+00	0.00E+00	0.00E+00	5.00E+02
cryptomona spp. 21-30	1.20E+03	9.50E+03	6.30E+03	0.00E+00
isoselmis spp. hemiselmis 4 6	1.60E+03	2.70E+03	4.18E+04	1.71E+04
flagellate spp. 1-2	2.45E+05	5.72E+05	8.54E+05	5.13E+04
flagellate spp. 2-5	3.42E+04	9.00E+04	2.07E+05	1.14E+04
mesodinium rubrum	9.00E+02	3.20E+03	8.03E+04	6.00E+02

Cruise 89 04

Total Abundance (no. litre)

Taxon	9-2	9-3
synechococo spp.	6.04E+05	1.97E+06
dinobryon suecicum	0.00E+00	4.00E+03
dictyocha speculum	2.00E+02	0.00E+00
pseudopedi pyriformis	1.00E+03	1.50E+03
olisthodis carterae	1.00E+03	7.00E+02
chrysochro spp. 4-5.5	1.04E+06	1.99E+06
chrysochro spp. 6-10	1.03E+05	3.88E+05
leptocylin spores spiny	0.00E+00	6.20E+03
leptocylin minimus	0.00E+00	2.94E+04
leptocylin mediterraneu	0.00E+00	8.00E+02
thalassios nordenskiold	0.00E+00	2.00E+02
thalassios conferta	2.00E+02	1.10E+03
cerataulin pelagica	0.00E+00	4.00E+02
chaetocero cf.affine v.circinalis	0.00E+00	1.40E+03
chaetocero breve	0.00E+00	3.40E+03
chaetocero compressum	9.00E+03	3.63E+05
chaetocero convolutum	8.00E+02	2.00E+02
chaetocero danicum	2.00E+02	8.00E+02
chaetocero debile	2.00E+02	0.00E+00
chaetocero decipiens	0.00E+00	7.00E+02
chaetocero diadema	0.00E+00	6.00E+02
chaetocero didymum	0.00E+00	1.20E+03
chaetocero lorenzianum	2.00E+02	3.00E+02
chaetocero pseudocrinit	0.00E+00	6.60E+03
chaetocero radicans	0.00E+00	8.50E+03
chaetocero socialis	0.00E+00	6.00E+02
chaetocero subtile	0.00E+00	1.10E+03
chaetocero vixvisibilis	3.00E+02	4.00E+02
bacteriast delicatula	2.00E+02	3.58E+04
rhizosolen delicatula	0.00E+00	2.20E+03
rhizosolen fragilissima	6.00E+02	3.00E+02
rhizosolen fragilissima v.1	0.00E+00	2.30E+03
minuticell scriptus	1.50E+03	0.00E+00
thalassiot frauenfeldii	0.00E+00	1.00E+02
thalassion nitzschoides	1.00E+03	4.00E+03

thalassion bacillaris	0.00E+00	3.00E+02
nitzschia americana	4.00E+02	1.60E+03
nitzschia delicatissim	2.20E+03	3.60E+03
nitzschia pungens	0.00E+00	4.00E+02
nitzschia lineola	0.00E+00	3.00E+02
nitzschia closterium	9.00E+02	1.00E+03
nitzschia subfraudulen	0.00E+00	2.00E+02
nitzschia cylindroform	5.00E+02	1.70E+03
nitzschia impressa	1.00E+02	0.00E+00
nitzschia subcurvata	6.00E+02	0.00E+00
cylindroth fusiformis	0.00E+00	2.00E+02
pyramimona spp. 3-8	3.30E+03	1.82E+05
pterosperm spp. >7	0.00E+00	1.10E+03
prorocentr minimum v.balticum	1.80E+03	2.00E+02
scripsiell spp. glenodinium 15 20	0.00E+00	1.00E+02
cochlodini citron	1.00E+02	0.00E+00
gymnodiniu gracilentum	1.60E+03	0.00E+00
gymnodiniu agiliforme	2.00E+02	3.00E+02
gymnodiniu paulseni	2.00E+02	0.00E+00
cryptomona spp. 5-10	1.25E+05	2.70E+04
cryptomona spp. 10.1-15	1.60E+03	3.56E+04
isoselmis spp. hemiselmis 4 6	3.95E+04	6.00E+03
flagellate spp. 1 2	1.35E+06	2.17E+06
flagellate spp. 2 5	2.96E+05	5.92E+05
mesodinium rubrum	2.10E+03	6.00E+03

DATA SECTION 7

ZOOPLANKTON IDENTITY AND ABUNDANCE

Table 11 Zooplankton taxonomic list

Table 12 OE8902 Zooplankton identity and abundance (vertical net hauls)

Table 13 OE8902 Zooplankton identity and abundance (EPCS calibration samples)

Table 14 OE8904 Zooplankton identity and abundance (vertical net hauls)

Table 15 OE8904 Zooplankton identity and abundance (EPCS calibration samples)

TABLE 11 ZOOPLANKTON SPECIES LIST: CRUISES OE8902 AND OE3904

- **Protozoa**
  - Foraminiferida
- **Cnidaria**
  - Medusae
  - Hydrozoa
    - Aglantha
    - Eutonia
    - Phialidium
    - Probiscodactyla
    - Sarsia
  - Siphonophora
    - Siphonophore nectophores
    - Dimophyes
    - Muggiaea
  - Scyphozoa
    - Aurelia
- **Ctenophora**
  - Tentaculata
    - Pleurobrachia
- **Mollusca**
  - Gastropoda
    - Gastropod veligers
  - Pteropoda
    - Limacina
  - Bivalvia
    - Bivalve veligers
- **Annelida**
  - Polychaeta
    - Polychaete trochophores
    - Polychaete larvae
    - Polynoid larvae
- **Bryozoa**
  - Cyphonautes larvae
- **Arthropoda**
  - Crustacea
    - Cladocera
      - Evadne
      - Podon
    - Ostracoda
      - Conchoecia
    - Copepoda
      - Copepod nauplii
    - Calanoida
      - Calanoida (unidentified)
      - Acartia
      - Acartia clausi
      - Acartia longiremis
      - Calanus
      - Calanus marshallae
      - Calanus pacificus
      - Candacia columbiae
      - Centropages abdominalis
      - Ctenocalanus vanus
      - Eucalanus bungii
      - Euchaeta
      - Euchaeta elongata
      - Gaidius pungens
      - Lucicutia flavicornis
      - Mesocalanus tenuicornis
      - Metridia
      - Metridia pacifica
      - Microcalanus pygmaeus pusillus
      - Neocalanus cristatus
      - Paracalanus parvus
      - Pseudocalanus minimus/elegans
      - Scolecithricella minor
      - Tortanus discaudatus
    - Cyclopoida
      - Corycaeus anglicus
      - Oithona similis
      - Oithona atlantica
    - Harpacticoida
      - Harpacticoida (unidentified)
    - Cirripedia
      - Barnacle nauplii
      - Barnacle cyprids
    - Euphausiacea
      - Euphausiid nauplii
      - Euphausiid juveniles
      - Euphausiid calyptopsis
      - Euphausiid furcilia
      - Euphausia pacifica
      - Thysanoessa longipes
      - Thysanoessa spinifera

- Decapoda
  - Decapod zoea
  - Axiidae
  - Caridea
    - Caridean zoea
    - Caridean mysis
    - Crangonidae
    - Pasiphaea pacifica
    - Pandalidae
    - Pasiphaea pacifica
  - Anomura
    - Pagurid zoea
    - Pagurid megalope
    - Porcellanidae zoea
  - Brachyura
    - Brachyuran zoea
    - Brachyuran megalope
- Mysida
  - Holmselia anomola
- Isopoda
  - Isopoda
- Amphipoda
  - Gammaridea
    - Cyphocaris challengeri
    - Melphidippa
    - Stilipes
  - Hyperiidea
    - Hyperiidae
    - Hyperia
    - Parathemisto pacifica
    - Primno abyssalis

Echinodermata

- Echinoderm pluteus
- Asteroidea
  - Asteroid larvae

Chaetognatha

- Chaetognatha
- Chaetognath juvenile
- Sagitta elegans
- Sagitta scrippsae
- Eukrohnia hamata

Urochordata

- Larvacea
  - Oikopleura
  - Fritillaria

Vertebrata

- Pisces
  - Fish larvae

Miscellaneous

- Unclassified eggs

TABLE 12 ZOOPLANKTON ABUNDANCE: OE8902

Bongo vertical net haul: animals.m-2

	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9
Depth of haul:	150m	150m	120m	85m	27m	24m	32m	60m
Taxon:								
Acartia 1-4	1232		5538	8616	2460	922	27927	1230
Acartia clausi 5								
Acartia clausi 6f	308							
Acartia clausi 6m		308						
Acartia longiremis 5	308		4924	10462	2152		6206	18462
Acartia longiremis 6f	308		2461	11693	2767		1862	4923
Acartia longiremis 6m	1232		3077	10462	3690		1862	2462
Aglantha s2	29	20						
Asteroid larvae								
Aurelia						15		
Axiidae s1								
Barnacle cyprids	308		616	615	308			
Barnacle nauplii	1232			1231	5227	3994	7447	
Bivalve veligers	3077	615	1846	5539	2152	25805	13033	2462
Brachyuran megalops s1								
Brachyuran megalops s2								
Brachyuran zoea s1				1846	1537	3072		
Brachyuran zoea s2								
Calanoida 1-3 (unidentified)	3384	77	2461	3692	3690	1536	620	6154
Calanus 1-3			1846	4308	2152		1862	11077
Calanus marshallae 4	308			3692	308		620	1230
Calanus marshallae 5	615		616	3692	308		620	2462
Calanus marshallae 6f		1539	1231	7385			1241	1230
Calanus marshallae 6m				615				1230
Calanus pacificus 6f		308						
Candacia columbiae 6f	308							

OE8902 (cont.)	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9
Candacia columbiae 6m		308						
Caridean mysis c1			616		616		2463	
Caridean mysis c2	67		48	116	67	67	67	19
Caridean mysis c3		9			10	10		
Caridean zoea c1		616		1231				
Centropages abdominalis 1–4						307		
Centropages abdominalis 5					308	307	1241	3692
Centropages abdominalis 6f								1230
Centropages abdominalis 6m	308			1231				
Chaetognath juvenile c1								
Chaetognath juvenile c2	39	29	10	500		10	10	192
Chaetognatha c3			38		10			
Conchoecia c1	6770	5538	1846			307		1230
Copepod nauplii	2154	308	5538	11077	2460	307	2463	12308
Corycaeus anglicus 5								
Corycaeus anglicus 6f			616					
Crangonidae c2							20	
Ctenocalanus vanus 5					922			
Ctenocalanus vanus 6f					308			
Cyphocaris challengeri c1	923							
Cyphocaris challengeri c2	693	212	240	20				
Cyphocaris challengeri c3	29	9	58					
Cyphonautes larvae	1847	9646						
Dimophyes c1			616					
Dimophyes c2	20	9	10					
Echinoderm pluteus c1				615	615	614	3724	
Eucalanus bungii 5f								10
Eucalanus bungii 6m							10	
Eucalanus bungii 6f								
Eucalanus bungii 6m			10					
Euchaeta 1–2	615							
Euchaeta 3	615		616					

OE8902 (cont.)	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9
Euchaeta elongata 6f	20	491	98					
Euchaeta elongata 6m	48	39	616					
Euchaeta elongata 6f	116	268	134					
Euchaeta elongata 6m	29	125	144					
Eukrohnia hamata e2	29	9						
Eukrohnia hamata e3	9	9	67					
Euphausia pacifica f		11	10					
Euphausia pacifica m		9						
Euphausia pacifica e2	29						10	
Euphausia pacifica e3		9						
Euphausiid calyptopis e1	308	1232	1231	3077	1846	307		
Euphausiid furcilia e1		308		615	308	307		
Euphausiid juveniles e1								
Euphausiid juveniles e2	29	9					10	
Euphausiid nauplii	3077			3077	4920		820	3692
Eutonia								
Evadne e1	3693	1539	616			6802	1662	3692
Fish larvae e2			10		10			
Fish larvae e3	9		10					
Fritillaria e1	615					922		
Gaidius pungens 5	308							
Gastropod veligere e1	308		616		615	2150		
Harpacticoida (unidentified)								
Holmselia anomola e2			10					
Holmselia anomola e3			58					
Hyperia e1								
Hyperiidae e1	308	615	1846	615				
Isopoda e1			616					
Limacina e1	308			3692	922	6294	3724	1230
Lucicutia flavicornis 6m		308						
Medusae e1								
Medusae e2								

OE8902 (cont.)	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9
Metphidippa s2								
Mesocalanus tenuicornis 6	308							
Metridia 1–4	615	4001	1846			307		
Metridia pacifica 1–4		308	3692					
Metridia pacifica 5f	923	1539	1846	615				2462
Metridia pacifica 5m	615	2154	2461				620	1230
Metridia pacifica 6f	1847	1539	4308	1231				
Metridia pacifica 6m	3077	41231	9230	615				
Microcalanus pygmaeus pusillus 5	2154	1539	4924					
Microcalanus pygmaeus pusillus 6f	4923	3693	4924					
Microcalanus pygmaeus pusillus 6m	615							
Mugglaea c1					922			
Mugglaea c2					10	269	39	
Mugglaea c3								
Neocalanus cristatus 5		9						
Oikopleura c1	1847		4924	1846	6457	23040	35996	
Oikopleura c2	173	192	548	183		19		38
Oikopleura c3								
Oithona atlantica 1–5		615						
Oithona atlantica 6f	308	923						
Oithona atlantica 6m								
Oithona similis 1–5	1232	12615	5536	3077	1537	2150		2462
Oithona similis 6f	12615	4616	7385	4308	2152	3688	10550	12308
Oithona similis 6m	308	615	616	2462	615			1230
Oncaea conifera 6f			616					
Pagurid megalope c2					10			
Pagurid zoea c1			616		1846			
Pagurid zoea c2				126	29	10		29
Pagurid zoea c3								
Pandalidae c2			29					
Pandalidae c3								19
Paracalanus parvus 5								

OE8902 (cont.)	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9
Parathemisto pacifica f	116	77	106					
Parathemisto pacifica m	107	20	36					
Parathemisto pacifica o1	308		1231				620	
Paraphasa pacifica f		9						
Paraphasa pacifica o3		29						
Phialidium o1								
Phialidium o2				9	10	46	39	10
Phialidium o3				29		67	107	19
Pleurobrachia o1						307		
Pleurobrachia o2						10		
Pleurobrachia o3								
Podon o1	615							
Polychaete larvae o1				615			1241	
Polychaete larvae o2					10			
Polychaete trochophores o1	1539		616		2152	307	620	
Polynoid larvae o1							620	
Porcellanidae zoea o1				615				
Porcellanidae zoea o2								
Primno abyssalis f			10					
Primno abyssalis m			29					
Primno abyssalis o1			1231					
Primno abyssalis o2		20	10					
Probiosdactyla o1								
Probiosdactyla o2								
Probiosdactyla o3								
Pseudocalanus min/el 1-4				6154	2460		1241	4923
Pseudocalanus min/el 5f	1539	923	3077	8616	3382	307	3724	13536
Pseudocalanus min/el 5m	1539	308		3077	2152		4965	4923
Pseudocalanus min/el 6f	1539	1847	21539	59692	31670	1229	14894	73846
Pseudocalanus min/el 6m	1847	615	1846	20923	2152		620	11077
Sagitta elegans o2		116						
Sagitta elegans o3	2538	1193	1386	490			20	1298

OE8902 (cont.)	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9
Sagitta scrippsae s3								
Sarsia s2								
Scolecithricella minor 6f		308						
Siphonophore nectophores s1						18667	6627	
Siphonophore nectophores s2						29		
Stilipes s2			29					
Thysanoessa spinifera s2								
Thysanoessa longipes m		20						
Thysanoessa longipes s2								
Tortanus discaudatus 6						614	620	
Tortanus discaudatus 6f								
Tortanus discaudatus 6m								
Unclassified eggs	17538	17231	32000	30184	31362	3686	1662	18462

TABLE 13 ZOOPLANKTON ABUNDANCE: OE8902

EPCS Calibration Samples: (animals.m-3) (Based on approx. 250L sample)

Taxon:	EPCS D	EPCS E	EPCS F
Acartia 1-4	522		29
Acartia clausi 5			22
Acartia clausi 6m			4
Acartia longiremis 5	203		11
Acartia longiremis 6f	232	7	
Acartia longiremis 6m	116		7
Barnacle cypride			18
Barnacle nauplii	87	14	62
Bivalve veligers	29	43	4
Brachyuran megalope s1		7	
Brachyuran zoea s1	1014	391	11
Calanoida 1-3 (unidentified)	174		4
Calanus 1-3	435	101	
Calanus marshallae 4	290	87	
Calanus marshallae 5	841	43	
Calanus marshallae 6f	203	29	
Calanus marshallae 6m			
Caridean mysis s2	87		
Caridean mysis s3	29		
Caridean zoea s1		29	
Caridean zoea s2			
Centropages abdominalis 1-4			
Centropages abdominalis 5		7	
Centropages abdominalis 6f		14	
Centropages abdominalis 6m			

OE8902 (cont.)	EPCS D	EPCS E	EPCS F
Chaetognath juvenile s1			
Conchoecia s1			
Copepod nauplii	203	297	58
Corycaeus 1–5			
Corycaeus anglicus 6f			
Cyphonautes larvae			11
Decapod zoea s1			
Echinoderm pluteus s1	29		
Euphausiid calyptopsis s1	319	60	
Euphausiid furcilia s1	29		
Euphausiid juveniles s1			
Evadne s1	116	174	29
Fish larvae s1			
Gastropod veligers s1	29		
Harpacticoida (unidentified)		7	
Hyperia s1			4
Limacina s1	29		4
Metridia pacifica 5f	29		
Metridia pacifica 6f		7	
Metridia pacifica 6m	29		
Mugiaea s1			
Oikopleura s1			
Oithoina 1–6			
Oithona similis 1–5		7	11
Oithona similis 6f			
Pagurid zoea s1	87	7	
Paracalanus parvus 5			
Paracalanus parvus 6f			
Paracalanus parvus 6m			
Phialidium s1			
Podon s1		7	26
Polychaete larvae s1			

OE8902 (cont.)	EPCS D	EPCS E	EPCS F
Polychaete trochophores e1			
Polynoid larvae e1			
Porcellanidae zoea e1	58		
Pseudocalanus min/el 1–4	29	14	
Pseudocalanus min/el 5f	203	7	
Pseudocalanus min/el 5m	29		
Psuedocalanus min/el 6f	87	7	
Psuedocalanus min/el 6m			
Unclassified eggs	29		

TABLE 14 ZOOPLANKTON ABUNDANCE: OE8904

Bongo vertical net haul: animals.m-2

	Stn 1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9
Depth of haul:	150m	150m	100m	73m	36m	24m	25m	85m	130m
Taxon:									
Acartia 1-4	4923	9846		4926	476	1229	2462	6154	1231
Acartia clausi 5	7384								
Acartia clausi 6f	2462	1232	1231			307			2461
Acartia clausi 6m						307			1231
Acartia longiremis 5		1232	6154	8618	476	307	4923	6154	3692
Acartia longiremis 6f	4923	3693	3692	2462	316		4308	2462	
Acartia longiremis 6m	2462		2462	3693	158	307	616	12308	4923
Aglantha e2					40	87	29		
Asterold larvae								1231	
Aurelia					30				
Axiidae e1					316				
Barnacle cypride			2462		1108			1231	3692
Barnacle naupii	4923	3693	11077	11080	633	614	2462	6154	3692
Bivalve veligers	27077	7384	20923		5064	11674	14154	3692	73847
Brachyuran megalope e1		1232							
Brachyuran megalope e2								9	
Brachyuran zoea e1			2462	1231	791	1229	1231		
Brachyuran zoea e2		39		9			10		
Calanoida 1-3 (unidentified)	17231	17231	12308	23391	13451	17510	27692	9846	82462
Calanus 1-3	118154	34461	9846	7387	475		2462	23384	29539
Calanus marshallae 4	44307	27077	6615	2462	158			4923	6615
Calanus marshallae 5	12308	7384	6615	3693				2462	1231
Calanus marshallae 6f	2462	2462	2462	1231			616	2462	
Calanus marshallae 6m	7384	2462		1231				3692	2461
Calanus pacificus 6f									
Candacia columbiae 6f									

OE8904 (cont.)	Stn 1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9
Candacia columbiae 6m									
Caridean mysis s1									1231
Caridean mysis s2		192	19	48	60	173	58	9	29
Caridean mysis s3	9								
Caridean zoea s1			2462	2462	475	307	616	2462	
Centropages abdominalis 1–4			3692			1229			27076
Centropages abdominalis 5	2462	1232	1231	2462	158	1536		1231	7384
Centropages abdominalis 6f									1231
Centropages abdominalis 6m									
Chaetognath juvenile s1				2462			1846		
Chaetognath juvenile s2	221	77	48	29	10		48	38	9
Chaetognatha s3			10	9					
Conchoecia s1	2462								4923
Copepod nauplii	4923	1232	4923	7387	316		1846	11077	6154
Corycaeus anglicus 5					158				
Corycaeus anglicus 6f					158				
Crangonidae s2				19			29		
Ctenocalanus vanus 5									
Ctenocalanus vanus 6f									
Cyphocaris challengeri s1									
Cyphocaris challengeri s2	39	155	10						529
Cyphocaris challengeri s3	20								48
Cyphonautes larvae							616	1231	
Dimophyes s1									
Dimophyes s2									9
Echinoderm pluteus s1	36923	3693		8618	316		4923	46770	26108
Eucalanus bungii 5f			10						
Eucalanus bungii 5m				9					
Eucalanus bungii 6f				9					
Eucalanus bungii 6m									
Euchaeta 1–2									
Euchaeta 3									

OE8904 (cont.)	Stn 1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9
Euchaeta elongata 5f									20
Euchaeta elongata 5m									
Euchaeta elongata 6f	9								20
Euchaeta elongata 6m									20
Eukrohnia hamata e2		39							
Eukrohnia hamata e3	20		10						9
Euphausia pacifica f									20
Euphausia pacifica m									
Euphausia pacifica e2		118	29			10		87	20
Euphausia pacifica e3									
Euphausiid calyptopis e1	98462	22154	4923	6618	6646	3686	38154	20923	11077
Euphausiid furcilia e1	32000	6155		1231	6697	3072	1231	6154	
Euphausiid juveniles e1				2462					
Euphausiid juveniles e2		500	10						
Euphausiid naupili	4923	2462	2462	3693			5539	3692	
Eutonia			96	318	60	10	3077	9	39
Evadne e1	66462	19692	36154	35701	19464	40550		2462	11077
Fish larvae e2				9				9	9
Fish larvae e3					10				
Fritillaria e1						3379	8000		
Gaidius pungens 6									
Gastropod veligere e1	2462				158	922			
Harpacticoida (unidentified)					316				
Holmsiella anomola e2									
Holmsiella anomola e3									
Hyperia e1		6618							
Hyperiidae e1									1231
Isopoda e1									
Limacina e1	4923			3693	475	3686			3692
Lucicutia flavicornis 6m									
Medusae e1							4308		
Medusae e2							616		

OE8904 (cont.)	Stn 1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9
Melphidippa s2				9					
Mesocalanus tenuicornis 6									
Metridia 1–4	12308	26308	1231	1231					14769
Metridia pacifica 1–4		2462							
Metridia pacifica 6f	4923	7384	3692						4923
Metridia pacifica 6m		8616	1231						3692
Metridia pacifica 6f		1232							6154
Metridia pacifica 6m	7384	2462			316				1231
Microcalanus pygmaeus pusillus 5			1231						11077
Microcalanus pygmaeus pusillus 6f		1232							8616
Microcalanus pygmaeus pusillus 6m									2461
Mugilaea s1					1583	2765			
Mugilaea s2				48	1396	1632	481	0	
Mugilaea s3						19			
Neocalanus cristatus 6									
Oikopleura s1		1232	1231	11080	3165	21811	45539	6154	1231
Oikopleura s2	183		38						586
Oikopleura s3			10						20
Oithona atlantica 1–5									
Oithona atlantica 6f									2461
Oithona atlantica 6m									
Oithona similis 1–5	14769	8616			949	514		1231	1231
Oithona similis 6f			8615	6156	633	2150	616	9846	6154
Oithona similis 6m				2462					
Oncaea conifera 6f									
Pagurid megalope s2		39							9
Pagurid zoea s1									
Pagurid zoea s2		39	20	9		19		20	
Pagurid zoea s3		39							
Pandalidae s2									
Pandalidae s3		39							9
Paracalanus parvus 6				1231		922			

OE8904 (cont.)	Stn 1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9
Parathemisto pacifica f	39	731	58						9
Parathemisto pacifica m	20	500	38						
Parathemisto pacifica c1									
Paraphasa pacifica f									
Paraphasa pacifica c3	9								
Phialidium c1					316				
Phialidium c2	39	39	19	135	79	10	58	135	29
Phialidium c3	29	116		134	445		39	116	14
Pleurobrachia c1					158				
Pleurobrachia c2			29	67	40	19	96	29	
Pleurobrachia c3								9	
Podon c1	9846	14769	33231	27084	2373	8204	1848	1231	14769
Polychaete larvae c1		2462	1231		1583	614	616	7385	
Polychaete larvae c2							19		
Polychaete trochophorae c1			1231	4925	1108	3686	3692		4923
Polynoid larvae c1					158	614	616		
Porcellanidae zoea c1					158	307	0		
Porcellanidae zoea c2							19		
Primno abyssalis f									
Primno abyssalis m									
Primno abyssalis c1									
Primno abyssalis c2									9
Probiscodactyla c1					633				
Probiscodactyla c2			10		49			9	
Probiscodactyla c3			10						
Pseudocalanus min/el 1–4	9846	19692	12308	26315	2057	3994		72616	102154
Pseudocalanus min/el 5f	73847	35693	30769	29646	1741	2765		81231	51692
Pseudocalanus min/el 5m	44307	27077	8615	14773	1108	2150	2462	43077	56615
Pseudocalanus min/el 6f	140307	43077	39385		1424	1536	3077	70154	97231
Psuedocalanus min/el 6m	39364	923	32000		475	614	1231	51692	18461
Sagitta elegans c2				673					
Sagitta elegans c3	98	9364	2788				10	1346	3269

OE8904 (cont.)	Stn 1	Stn 2	Stn 3	Stn 4	Stn 5	Stn 6	Stn 7	Stn 8	Stn 9
Sagitta scrippsae e3		39							
Sarsia s2				19	20				
Scolecithricella minor 6f				1231					1231
Siphonophore nectophores e1					15824	31027	14769		
Siphonophore nectophores s2									
Stilipes s2									
Thysanoessa spinifera s2		269	29	19				183	
Thysanoessa longipes m									
Thysanoessa longipes s2		39							
Tortanus discaudatus 5					316	2768			
Tortanus discaudatus 6f						307			
Tortanus discaudatus 6m						307			
Unclassified eggs		7384	35692				5539	51692	22153

TABLE 15 ZOOPLANKTON ABUNDANCE: OE8904

EPCS Calibration Samples: (animals.m-3) (Based on approx. 250L sample)

	EPCS A	EPCS E	EPCS G	EPCS I	EPCS J	EPCS M	EPCS N	EPCS P
Taxon:								
Acartia 1-4			119	830	30			
Acartia clausi 5	476					15	30	15
Acartia clausi 6m								
Acartia longiremis 5	119	714			90	75		
Acartia longiremis 6f	238	654	119		30	15	45	
Acartia longiremis 6m		357	237			15	30	
Barnacle cypride		59	119			30		
Barnacle nauplii	1546	357	711	119	179	119	119	30
Bivalve veligere		59	474	119	30	179	30	
Brachyuran megalope e1		119					15	
Brachyuran zoea e1	119		119			60	119	45
Calanoida 1-3 (unidentified)		178	356	2133	90	75	75	179
Calanus 1-3	5208	2498	2607	4859	119	60	149	15
Calanus marshallae 4	833	1844	1067	474		15	75	
Calanus marshallae 5		952	711	237				
Calanus marshallae 6f								
Calanus marshallae 6m		59						
Caridean myels e2								
Caridean myels e3								
Caridean zoea e1	4401			4859		239	119	104
Caridean zoea e2							15	
Centropages abdominalis 1-4					119		45	60
Centropages abdominalis 5	238		119	237	60		90	104
Centropages abdominalis 6f				356			15	45
Centropages abdominalis 6m					30		15	

OE8904 (cont.)

Chaetognath juvenile s1							15	
Conchoecia s1				119				
Copepod nauplii	357	119		474		15	75	
Corycaeus 1–5								
Corycaeus anglicus 6f								15
Cyphonautes larvae								
Decapod zoea s1							60	
Echinoderm pluteus s1		59					15	
Euphausiid calyptopsis s1	714	178	474	237	30	328	75	30
Euphausiid furcilia s1	357	119	119			60	15	
Euphausiid juveniles s1								
Evadne s1	3807	833	9837	830	2667	493	239	284
Fish larvae s1				119			15	
Foraminiferida								30
Gastropod veligers s1		59				30	60	348
Harpacticoida (unidentified)								
Hyperia s1								
Limacina s1	238	59				45	45	134
Metridia pacifica 5f								
Metridia pacifica 6f								
Metridia pacifica 6m								
Mugilasea s1						15		
Oikopleura s1						75		
Oithona 1–5			237					
Oithona similis 1–5		59					15	
Oithona similis 6f			119		30			
Pagurid zoea s1								15
Paracalanus parvus 5	238	59	237		60	59	15	209
Paracalanus parvus 6f	238	119	474	119	30	264	15	418
Paracalanus parvus 6m	357		237			75		75
Phialidium s1								
Pleurobrachia s1								15

OE8904 (cont.)

Podon e1	1071	236	9244	474	4000	562	119	1179
Polychaete larvae e1		59				45		
Polychaete trochophores e1	119						15	15
Polynoid larvae e1			119			75	15	
Porcellanidae zoea e1							134	15
Pseudocalanus min/el 1–4		178		3556	30	30	164	30
Pseudocalanus min/el 5f		833	119	2133		15	418	15
Pseudocalanus min/el 5m		535	237	3556		15	254	30
Psuedocalanus min/el 6f		773		237		30	119	15
Psuedocalanus min/el 6m							45	
Unclassified eggs		119						